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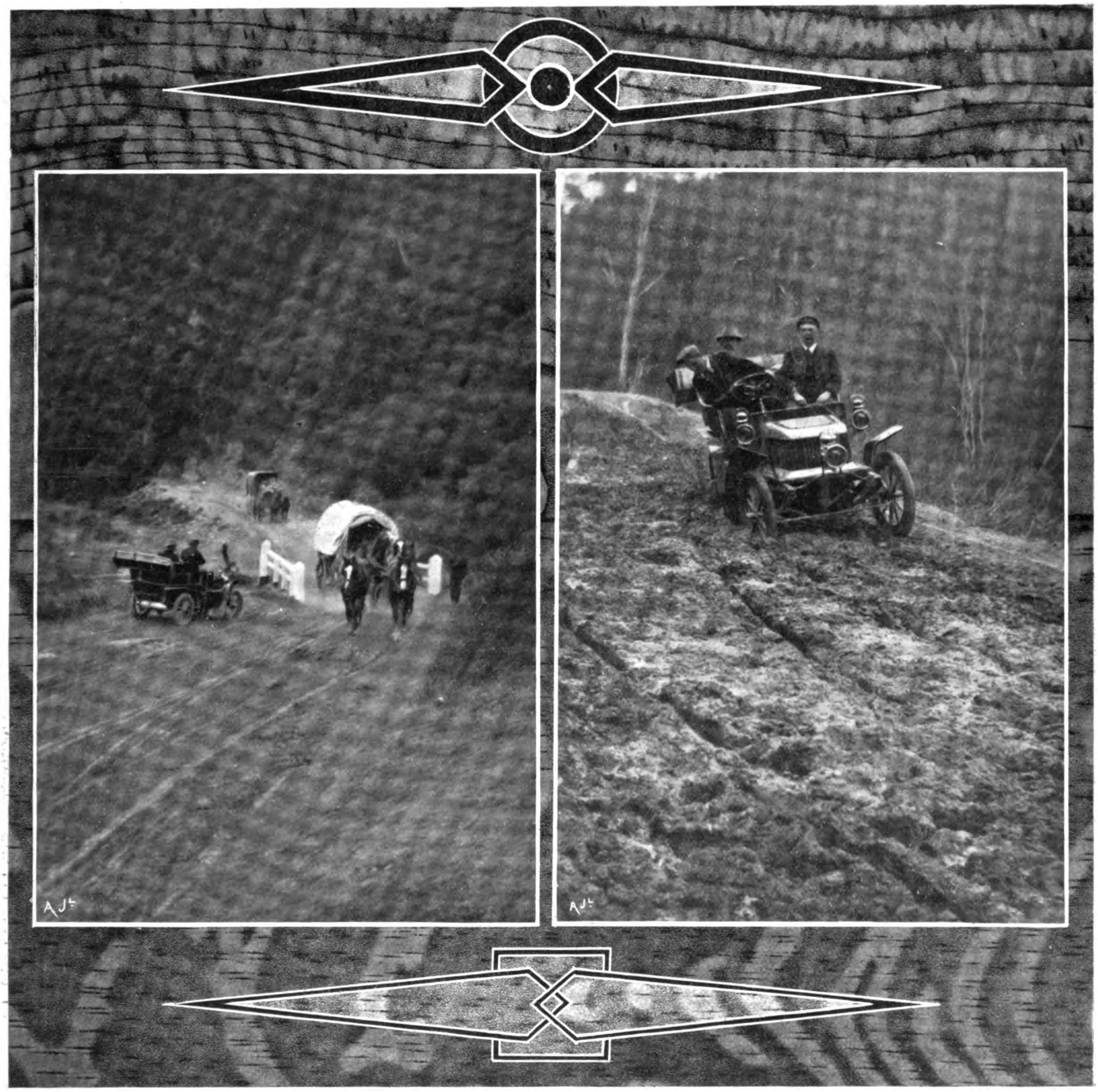

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British Events.

Jan. 15 ...	"Indicated and Horse Power of Motors," by Prof. Archibald Barr, D.Sc. (Scottish A.C.).
Jan. 15–20 ...	Brighton Automobile Exhibition.
Jan. 17 ...	Auto-Cycle Club Dinner.
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Jan. 20 ...	Auto-Cycle Club Quarterly Trial.
Jan. 26–Feb. 3	Crystal Palace Motor Show.
Jan. 26–Feb. 3	Edinburgh Show.
Jan. 27 ...	Tri-Car Hill-Climb, Lewisham A.C.
Feb. 15 ...	*4,000 Miles Tyre Trials.
Feb. 15 ...	*Lamp Trials.
Feb. 9–17 ...	Liverpool Motor Show.
Feb. 9–17 ...	Newcastle Motor Show.
Feb. 10 ...	Tri-car Hill-Climb, River Hill (Lewisham A.C.).
Feb. 19 ...	Scottish A.C. (Western) Annual Dinner.
Feb. 23–Mar. 3	Manchester Motor Show.
March 9–17...	Glasgow Motor Car Show.
March 24–31	Cordingley and Co.'s Motor Show.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
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Jan. 13–20 ...	Brussels Exhibition.
Jan. 13–20 ...	American A.C. Show, New York.
Jan. 17–20 ...	Western Indian Trials.
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Jan. 26–30 ...	Calcutta Motor Trials.
Feb. 3–18 ...	Berlin Motor Show.
Feb. 3–18 ...	Turin Automobile Show.
Feb. 5–11 ...	Paris Voiturettes and Tri-car Trial (*Les Sports*).
March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
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May 6 ...	"Targa" Florio (Sicily).
May 13–14 ...	Tour de France (Motor Cycles and Voiturettes).
June 10–16 ...	Herkomer Cup.
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July 14–17 ...	Ostende Meeting.
Sept. 10 ...	Florio Cup Race (Italy).
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PASSING EVENTS.

Reasonable Proposals.

Automobilists have made out their "articles of faith" to which Members of Parliament are to subscribe as a condition of securing automobile support at the coming General Election, and in the advertisement pages (page xvii.) of the current issue a form appears with these questions properly set out, in such shape that any of our readers can easily remove it, if opportunity serves to induce a prospective candidate to subscribe his signature. If we get a good number of Members in the coming House of Commons who have pledged themselves to these three provisions, the prospects of automobilism in the future should be satisfactory. It is well to remember, however, that there is another side to the question. We do not mean merely the hostile side, but the side of people who really have legitimate rights on the high road. From this point of view we note, with full approval, that the Cyclists' Touring Club and the National Cyclists' Union are also endeavouring to enlist the good offices of intending candidates for Parliament on behalf of legislation which will be :—

(1) An Act rendering it compulsory for all vehicles to carry lights at night.

(2) An amendment of the Motor Car Acts, whereby greater protection may be afforded to cyclists and other road users on the King's highway, and

(3) An improvement in our methods of road administration.

At the same time these well organised bodies are supporting amendments to the existing motor car law, chief amongst which is that it shall be made penal for any motor car driver to go round a corner on the wrong side, unless his view is open and unobstructed. The first proposal given above we have always been in favour of and we will certainly be glad to see the cyclists successful in preventing what we have always considered one of the greatest possible abuses of the road, this dangerous method of rounding corners ; in fact, we would even go further than they do and make it illegal for any vehicle to round a corner on the wrong side, whether there is a clear view or not, unless some very special circumstances render it unavoidable.

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Commercial Motor Boat Development.

The promise of the Government to introduce at an early date legislation designed to improve the value of our canals as a means of transport and communication, on which we commented a short while ago, may almost be said to synchronise with some very important experiments now being conducted under the auspices of Messrs. Thornycroft and Co. on the application of the suction producer to boat propulsion. The principle involved in the suction producer has been made familiar to all our readers. It may be shortly described as an invention by means of which an internal-combustion engine is able to make its own gas from coke or anthracite as it requires it, and the resulting motive power, needless to say, is remarkable for its cheapness. Messrs. Thornycroft and Co. have been conducting experiments on the Thames with a motor barge fitted with the Capitaine suction producer, and now this barge is to be tested in carrying freight from point to point along our system of inland canals under regular working mercantile conditions. A start was made from Brentford on Tuesday morning with a regular cargo which is to be delivered somewhere near Birmingham or Wolverhampton, and the motor-driven barge is to ply exactly under similar conditions to those which prevail in the case of horse-pulled canal barges. There is no more trying labour for the horse than canal work. It is collar work all the time, so that all true lovers of the equine race will be delighted to find this heaviest of his labours taken over by the motor boat.

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A Splendid Opening.

The list of places between which it is intended the motor barge should convey cargoes includes important Midland towns between London and Birmingham, and between Birmingham, Chester and Manchester, connecting up such places as Stoke-upon-Trent, Banbury and Oxford, to mention only a few of those which will be touched. These few names suggest what a splendid network of canals we possess, and how absurd it is that they should be so largely permitted to fall into disuse, and are only employed for transport under the antiquated conditions provided by the horse and the tow-rope. With effective legislation of the kind promised, and the success of the suction producer, which we do not doubt will be proved before long, the development of canal transport ought in a very short time to amount to an important national asset.

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A Proper Way to go to Work.

The administration of our highways and the methods of repairing them have been the subject of denunciation, indignation, vituperation, humorous banter, and persiflage for many years past. In spite of this and the energetic propaganda of the Roads Improvement Association, in spite of progressive district and county surveyors scattered here and there (alas! few and far between), the administration, such as it is, yet remains unaltered, and things muddle along in their old chaotic way. Nothing in the chaotic jumble has been more characteristic than the total absence of any scientific method in the selection of the materials with which the roads are repaired. There is not even any uniformity in the size to which the road metal is crushed, let alone any attempts to adapt different kinds of rock to different local requirements. It is therefore with lively satisfaction that all interested in road improvement, and automobilists, needless to say, lead opinion in this respect, will welcome the efforts made by the Corporation of Hornsey to obtain some reliable information as to the comparative values of different rocks for road-mending purposes. In order to obtain the services of experts on the problem, the Corporation approached the Board of Education, with the result that Dr. J. S. Flett and Mr. J. A. Howe, of the Museum of Practical Geology, Jermyn Street, assisted the Corporation in making a petrological examination of the rocks subjected to tests on the road. A regular collection of materials has, as a result, been assembled at Jermyn Street, including upwards of a hundred different specimens of road-mending stone. The rocks have been subjected to the mechanical attrition test both in the dry and wet condition, and the results noted so as to enable comparison between the different kinds of rock to be established. Scientific investigation of this kind must obviously, if carried out on a sufficiently extensive scale, prove ultimately of the highest value both in improving the general surface of our roads, and in saving cost in road upkeep. To employ expensive and high-class road material in some places is practically to throw it away ; to use cheap and inferior material in others where the traffic is severe is to incur great additional expense and shocking deterioration of the road surface. Of course, one swallow does not make a summer, and the adoption of scientific methods by one local authority cannot be expected to effect much, but it is a beginning which one may hope to see generally followed, so that when, in the near future, highway management becomes, as we trust it will be, centralised, scientific results may be available for the use of the central authority.

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The Melbourne-Sydney Reliability Trial.

Someone who is assumed to have been a philosopher was credited with saying that the general civilisation of a community may be gauged by the state of their roads and their treatment of foreigners. As far as the great Australian Republic is concerned, they most completely disprove the alleged philosopher's observation, for by common consent of motorists and others their roads are positively shocking. More shocking even, or, at any rate, quite as shocking as those interruptions in the landscape which pass by that name in America. At the same time they provide a magnificent testing ground for motors. Motors which can go through an extended trial on those roads and emerge—we will not say unscathed, but holding together, require no further certificate of reliability, and the hair-breadth escapes which tearing over them provides added enormously to the hilarity of everybody who took part in the Melbourne-Sydney reliability contest, of which we give a full account elsewhere. There were plenty of additional obstacles, in the way of "V"-shaped gulleys across the roads, similar to the French *cannivaux*, but here they were less painfully noticed, because the contrast, even the bumps which they occasioned, in comparison with the rest of the road, was far less noticeable than in France. The competition was not in any way intended for a race, but it more or less degenerated or developed into a race, owing to the quaint arrangement by which the reliability trial competitors were allowed to make up by mere high speed for delays caused by breakdowns. However, the object of the function was to amuse and interest the population in the automobile, and in this it most admirably succeeded, for probably no automobile event was ever the occasion of more unalloyed enjoyment and fun, to participants, to competitors, and to the public than this. The public, in fact, developed a perfect mania for speed, and the faster the cars went and the worse the roads were the more they were delighted. One small town that was provided by nature, or the neglect of the local authorities, with a particularly shocking stretch of road, made an application that a car might be run at maximum speed over it to amuse the populace. The request was granted, the car survived, nobody was killed, and even the police did not interfere. The trial was not entirely in the hands of the trade. Among the competitors were representatives of some of the wealthiest families in the colony, together with many a veteran cycle rider. The motorist of the Antipodes is quite as good at a yarn as his colleague nearer home, and the awesome stories, principally zoological, of the number of rabbits spificated by cars, of kangaroos who raced them on either side of the route, of snakes that wound round their wheels and countershafts, and of monstrous lizards, locally known as iguanas, who calmly stood and stared the competitors out of countenance, till even the most hardened automobilist drove on one side as if he had met a Surrey policeman, might for sheer truthfulness have been extracts from a company promoter's affidavit. Some of the speed performances were truly wonderful, and one of the sights of the whole function was to see a big Mercedes tearing down Money Money Hill, past its danger board and dangerous turns and shocking surface, without an accident happening; and how the competitors made their way in the dark at twenty miles an hour, as they did do, over some of the tracks they encountered, still remains a mystery. In spite of all the troubles and dangers, however, the best of humour prevailed, and this was not diminished when, at close of day, it was found (in conversation) that no less than ten different competitors had all run over and flattened out the same giant snake at the same cross roads, and all described in similar language how it hissed and spat as the wheels went over it. Its original discoverer, who came across it dead, had, it may be explained, carefully "placed" it by the wayside coiled up on the grass, with a few feet of its length protruding on to the road.

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"Direct-Drive": Is it a Monopoly?

Many of our readers will call to mind the uneasiness which prevailed in the automobile world generally when, in the year 1900, an attempt was made to maintain the Maybach carburettor patent as conferring a monopoly on its holders of all float-feed carburettors in use on motor cars. The attempt failed dismally, for the patent was declared invalid in the Court of First Instance; there was no appeal, and the British Motor Traction Company, which owned it, went into liquidation. At the present moment there is talk of a claim to a somewhat similar monopoly as being got up by the holders of the Renault patent, of which we gave a descriptive article the week before last. As will be seen from our correspondence columns, our article has evoked a letter from the Duryea Company, and we have also had a patent, taken out by Whitney in 1898 (No. 10,020) brought before our notice by Messrs. Gedge and Feeny, who cite it as an anticipation of the Renault invention. We do not propose to adopt the highly improper attitude of pronouncing an opinion on the validity of any patent which may or may not become at an early date the subject of litigation, though we are bound to admit that the Whitney patent, which, by the way, has been allowed to lapse, contains elements which very closely resemble those in the Renault, since both inventions include the use of live-axles driven by propeller shafts, and of change-speed-gearing that gives a "direct-drive" on the top speed. We do not, however, attach any importance to the American patent to which the Duryea Company apparently refer (we believe it to be No. 540,648, June 11th, 1895) for the car therein described and illustrated neither has a propeller-shaft with universal-joints, nor is a "direct-drive" provided for on any "speed."

In any case, however, it may confidently be predicted that, as in the case of the Maybach carburettor, neither manufacturers nor car users in this country are at all likely to acquiesce tamely in any attempt to set up a monopoly for some form of construction already adopted in the great majority of motor cars, without combining and making a tough fight of it. Already we notice that the Argyll Company, in sending a donation of £20 to the British Empire Motor Trades Alliance recently, offered to increase that amount to £100 if such litigation should arise.

MELBOURNE-SYDNEY RELIABILITY CONTEST.

TWICE during last year long distance trials for cars and cycles were organised by the Dunlop Company between Melbourne and Sydney. The start of the first test was from Sydney on February 21st, the run terminating on February 25th. In the November contest, however, the course was reversed, the start being from Melbourne on November 14th, the finish on November 18th being at Sydney—the full distance in each case totalling to 572 miles. The best time made in February was by H. L. Stevens, 23h. 42m., on a 12-h.p. Darracq, this time being bettered only by one in the November run, viz., by G. Hobbs, on an 18–28-h.p. Mercedes, 21h. 44m. H. L. Stevens, this time driving a 15-h.p. Darracq, was second best with 24h. 58m. H. Tarrant, who in February scored full points and second best with a 12-h.p. Argyll in 31h. 48½m., this time drove an 8–10-h.p. Tarrant, an Australian car built in Melbourne, securing full marks and making the time of 30h. 4½m. The winners were: Class A, 8-h.p. De Dion (full points); time, 33h. 20½m. Class C, 18–28-h.p. Mercedes (full points); time, 21h. 44m. Class D (cycles), 3½-h.p., Brown; time, 26h. 59½m. In Class B, no less than 5 cars tied with full points, these being a 10-h.p. Argyll, a 10-h.p. De Dion, a 12-h.p. Richard-Brasier, a 10–12-h.p. Talbot, and the 8–10-h.p. Tarrant. Under the rules these cars and the other "full pointers" therefore had to continue to run off further tests to decide the winner and holder of the Dunlop Trophy. The detailed times for each day, the total marks, and times, &c., are given in our table.

In the car section of the 29 entrants, 25 started on November 14th, and 8 cycles were despatched out of the 10 entrants. The course, as before, was the old coach road, and enthusiasm ran high amongst the country folk, who gathered at the wayside to cheer on the competitors. In the towns enormous crowds were drawn together to enjoy what must have been a similar experience to that which was afforded in Great Britain to the many thousands who made holiday to see the cars pass along in the now historical "1,000 Miles Trial."

Incidents were numerous throughout the trial. On the first day's run, the contestants were sent from the Haymarket, at Melbourne, early in the morning, and the excitement of the event caused a huge crowd of people to assemble and witness the cars leave on their trial. Mr. Foy, who had entered a Panhard car, did not start, because the Hon. Mrs. Bolder-Sykes, who was to drive, had not arrived from England in time. Mr. Hobbs' Mercedes was one of the fastest away from the mark, but nearly all the cars exhibited a remarkable turn of speed, for although the trial was strictly speaking a reliability contest, yet for the most part the competitors turned up in racing trim. Mr. Foster's 50-h.p. Talbot car, which he specially obtained to take part in the trial, was disabled through a crack in the water-jacket, which only made itself noticed as it was trying to overhaul the Mercedes just after the start. Some twenty miles on the northern side of Euroa, Mr. M'Kenzie's car broke its front axle in passing over one of the many dangerous V-shaped culverts, but the owner, being of a practical turn of mind, managed to effect repairs of a sort, which enabled him to drive into Euroa within the time limit—thus scoring full marks for that portion of the run. Tyre troubles were numerous in the original contest, it will be remembered, and it was not long before there was a heavy crop on this run also. Mr. Kellow was frequently delayed through this cause, and not being able

MELBOURNE-SYDNEY RELIABILITY TRIAL, November 14–18.—S. Day on his 8-h.p. De Dion car, the winner in the single cylinder class and of the Robert Hurst Trophy.

to reach that night's destination until 10 o'clock, he, consequently, obtained no marks for the journey. An exciting time befell the Pressmen, who were accommodated in a special car, and they ended their weird experiences by having to run ten miles in the dark, without lights, over a "road" which might more correctly have been termed a bush track; in fact, from Seymour the roads were abominable, always extremely rough, often made dangerous by deep ruts, and occasionally studded with tree-stumps.

Fair weather also favoured the competitors on the second day, and all started for Albury, just over 100 miles distant, in high spirits. Mr. M'Kenzie had his damaged axle repaired immediately after taking his car from the control, and by this he lost 97 minutes. In order to secure full marks under the regulations, by arriving at Albury within the time limit, he had to average 28 miles an hour, and it was while travelling at somewhat over this speed that his axle broke again in the place where it had been brazed. Once more he spliced it, and once more also was he able to reach his destination; on arrival he once more called in the help of a blacksmith, who spoiled the axle entirely in attempting to repair it, the car having, therefore, to be sent back to Mr. M'Kenzie's home by rail. An incident in Mr. Stevens' ride, on this day, was the charging of a railway gate near Wodonga; the level crossing was situated in the bend of the road, one gate was partly opened, the other closed, but both were carried away by Mr. Stevens' Darracq, which he was unable to pull up in time. Neither of the occupants were hurt, however, and the only damage which the car sustained was a slightly-bent front axle. This same crossing nearly caused Mr. Little to come to grief, for he was all but caught by a passing train. Engine troubles were experienced by Mr. Cox and Mr. Bolger, who each lost 24 marks through this cause. Mr. Kellow, who had decided the previous night to go no further than Albury, retired from the contest, and returned to Melbourne by road on the following day. What must have been an amusing incident—except for those who took part in it—was the occasion on which the De Dion and Argyll cars, driven by Mr. S. Day and Mr. W. R. Grimwade respectively, ran into a swarm of bees, which promptly settled themselves on the passengers with the usual result.

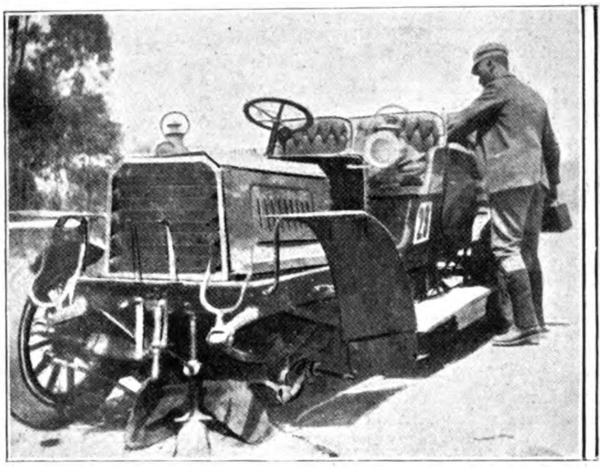
Photo by "Sydney Mail."

Top Row, reading from left to right: H. B. James (Vic.), (Organiser of Contest), G. Moffat (Vic.), S. Bolger (Vic.), — Buchanan (Vic.). Third Row (standing): C. E. Liddell, — Lough, ——— (C. E. Liddell's Chauffeur), R. Moffat (Vic.), S. Day (Vic.), J. W. Moffatt (Vic.), W. J. Proctor (General Manager, Dunlop Company), E. Bowen (Vic.), Cecil E. Fraga (Vic.), (Geo. Hobbs' Chauffeur). Second Row (seated): John Moffatt (Vic.), H. L. Stevens (Vic.), T. K. Rand (Vic.), H. Tarrant (Vic.), A. Fauvel (N.S.W.), W. Hurst (Vic.), J. C. Dillon (Vic.), S. Dalrymple (Vic.). Standing: ——— (H. Tarrant's Chauffeur). In Front: Otto Camphin (Vic.), — Corpe (S.A.), S. Maillard (N.S.W.), R. Morton (Eng.), J. Coleman (Vic.).

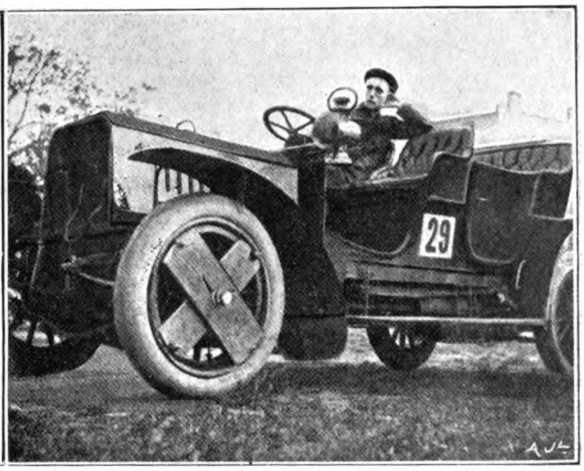
MELBOURNE-SYDNEY RELIABILITY TRIAL COMPETITORS AND OFFICIALS.

Millions of rabbits swarmed in droves along the hillsides of the country through which the cars passed during the third day's run. Many of them were also encountered on the roads, and so much curiosity did they exhibit in the approaching vehicles that some of them even forgot to get out of the way. Bad luck befell Mr. Arnott's Innes car near Mullengandra, for the near side front wheel was fractured in passing over some heavy sand just after crossing the bridge at that place. So much wrecked was the wheel that repair seemed out of the question, and a wagon was telegraphed for. To pass the time, however, Mr. Arnott experimented with some pieces of wood which he bolted across between the felloes, and he found that these, together with four of the least damaged spokes, were capable of supporting the car, so they continued the journey, and arrived at Gundagai only a little over three and half hours late. Mr. Fauvell's Richard-Brasier car broke a spring, but this also was repaired, and the car came in two hours late. A damaged steering-gear delayed Mr. Rand for an hour before he left Albury, and he lost seventy minutes on the road through punctures. Mr. Wittber's Wolseley also sustained damage to its steering-gear in passing over a rut, while Mr. Holmes experienced no less than three hours' delay on account of a choked carburettor and an over-heated brake.

There was never much of the steady-going reliability contest about this competition, and what little there was ultimately disappeared before the request of the authorities of Yass, who telegraphed asking that the first car to arrive there should run through the town at full speed in order that the residents might see what real speed was like. The streets were accordingly kept clear, and in due course Mr. Hobbs delighted the spectators by running through their township "at the rate of 45." Mr. Arnott was again unfortunately delayed, for his previous accident had affected the radiator of his car and its defect caused him considerable delay during this part of the run. Mr. Wittber was another competitor who had that common complaint of the district—a broken axle; he was able, however, to get it repaired by a local blacksmith at Yass, and he endeavoured to make up for lost



J. M. Arnott's smash at Mullengandra, near Albury.



Photos by "Sydney Mail."

Arnott's car, showing the repair to his wheel with hard wood, obtained from a farmhouse.

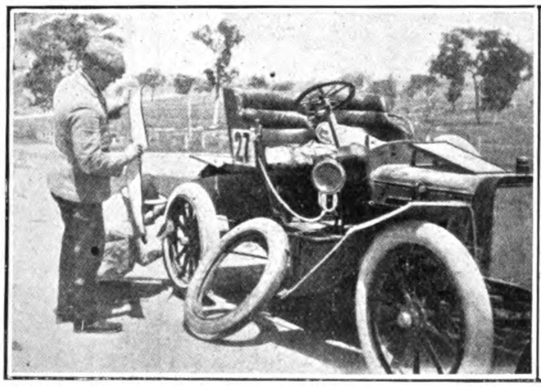
MELBOURNE-SYDNEY RELIABILITY TRIAL, November 14–18.

time by an average speed of about 28 miles an hour throughout the rest of the journey to Goulburn. Two cars—Mr. Cox's Talbot and Mr. Holmes' Alldays—retired when reaching their destination; Mr. Walker had no less than thirteen punctures during the run. On this day also the horrible "V" culverts were more numerous than ever.

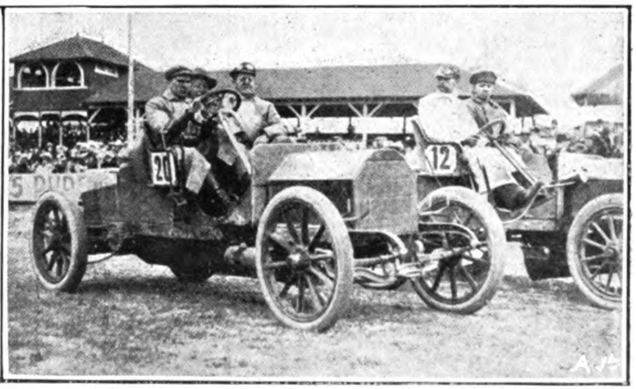
On the last day the weather turned dull, and the run developed into a race to Sydney, which was 129 miles distant. An early start was made from Goulburn. Mr. Hobbs covered the course with his Mercedes in a little over 4 hours, and he was followed by Mr. Stevens on his Darracq, both being received with hearty cheers by the great crowd assembled at the stopping-place to receive them. Although both cars arrived within the time limit, Mr. Hobbs was the winner in the Big Car Class, because Mr. Stevens had previously lost 10 marks, and this prevented him from making a tie. Mr. Dixon also would have received full marks had he not run out of petrol only 60 yards from the finish, and even then he could have run downhill and crossed the line, but for the fact that the spectators obstructed, so that he had to put on his brakes and stop the car. Mr. Arnott again suffered through his leaky radiator, and Mr. Rand was penalised through allowing his passengers to get out while ascending the Razorback Hill. Mr. Wittber lost seven minutes through the inlet-valve sticking, while Mr. Coleman also lost marks through the same cause. Mr. Day, with his 8-h.p. De Dion, was the leader among the single-cylinder car entries, while Messrs. Moffat, Grimwade, Fauvel, Wilkinson and Tarrant made a tie in class B, which was for cars of medium power. These latter, therefore, in order to decide the winner, had, on November 22nd, to run again from Sydney to Medlow Bath and back, a distance of 132 miles, during which the course rises 3,500 feet.

The cars taking part in the contest upon their arrival at Melbourne proceeded to the Agricultural Ground, where they received an ovation at a gymkhana organised in honour of the event by the A.C. of Australia.

The road taken by the cars to Medlow Bath was a severe test. Miles and miles of road had to be traversed where the surface consisted of loose deep sand and blue metal newly laid down. The hill-climbing about 40 miles out from Sydney included stretches of 1 in 6 and 1 in 5, whilst S-shaped curves were numerous. All got through except the Richard-Brasier, which had throughout the trial carried four passengers and kept a clean sheet. On crossing one of the fatal V-shaped culverts, near Penrith, at high speed, the right back spring broke, and Fauvel



Stevens' car that tried conclusions with the railway gates.



Photos by "Sydney Mail."

G. Hobbs and his Mercedes car, the winner in the heavy car class, and Capt. Tarrant's Australian-built Tarrant car (No. 12).

MELBOURNE-SYDNEY RELIABILITY TRIAL, November 14–18.

Photos by "Sydney Mail."

MELBOURNE-SYDNEY RELIABILITY TRIAL, November 14–18.—Along the whole route and including outlying country districts the occasion of the run was treated as a holiday, and schools and farm hands gathered along the roadside to see the cars go past. Our pictures above show some of these incidents. On the left is a scene of a "school out" on the Gundagai Road, in the centre one, watchers by the way at Kyambe are seen, and the right-hand picture is by the roadside at Tarcutta.

had no alternative but to retire. During the day Tarrant lost 3 points, but under the rules each competitor can lose 10 points altogether before being eliminated. The six survivors, therefore, were required once more to try their luck in determining the winner.

The next day's run was to Goulburn, 129 miles. All six made non-stop runs, Grimwade losing 3 points for adjustments. The following day, November 24th, the cars ran to Gundagai, 121 miles. Trivial matters resulted during the day in spoiling the absolute non-stop runs of all except Hobbs on his Mercedes, his mark sheet being still clear to date. On this day, too, a "V" culvert eliminated Moffat's 10-h.p. De Dion. In the next run, to Albury, Hobbs again came through without loss of a mark, and on the final run to Melbourne, on November 27th, the five remaining cars were still in perfect running order, and prepared apparently, like the brook, to "go on for ever." The position of the competitors at this last stage was as follows (full score 10 points):—

G. Hobbs (18-28-h.p. Mercedes), full points; S. H. Day (8-h.p. De Dion), 8 points; H. Tarrant (8-h.p.

Table showing the official time allowed for each stage, the times between each control, the car non-stop points and the motor cycle hill-climb points on the last day, the total points, and the times occupied.

	Euroa, 100 Miles.		Albury, 101 Miles.		Gundagai, 121 Miles.		Goulburn, 121 Miles.		Sydney, 129 Miles.		Non-stop Points.	Total Time.	Total Points.
	h. m.	points.	h. m.	points.	h. m.	points.	h. m.	points.	h. m.	points.		h. m.	
Class "A."—Single Cylinder. Time allowed	6 50		6 45		7 45		7 0		7 0				
S. Day, 8-h.p. De Dion	5 48	500	6 35½	500	7 14½	500	6 49½	500	6 53	500	500	33 20½	3,000
J. G. Coleman, 7-h.p. Swift	5 27	500	6 4½	500	7 32	500	6 50½	500	8 13	477	480	33 48	2,957
W. J. Warden, 7-h.p. Oldsmobile ...	4 55½	500	5 42	500	7 3	500	8 6	434	12 51	250	432	38 37	2,616
C. T. Holmes, 7-h.p. Alldays	5 48½	500	6 41	500	10 24	341							
R. Duncan, 7-h.p. Oldsmobile	5 58	500	6 49	406	7 29½	500	7 21½	473					
Class "B."—Light Cars. Time allowed	5 50		6 0		7 0		6 0						
J. W. Moffatt, 10-h.p. De Dion	4 27½	500	5 44½	500	6 45½	500	5 51½	500	5 55½	500	500	28 24	3,000
W. B. Wilkinson, 10-h.p. Argyll... ...	4 50	500	5 16	500	6 31	500	5 15½	500	6 0	500	500	27 52½	3,000
A. Fauvel, 12-h.p. Richard-Brasier ..	5 37½	500	5 21	500	6 53½	500	5 46½	500	6 9	500	500	29 47½	3,000
W. R. Grimwade, 10-12-h.p. Talbot ...	4 55	500	5 49½	500	6 49	500	5 59	500	6 28	500	500	29 59½	3,000
H. Tarrant, 8–10-h.p. Tarrant	4 54	500	5 44	500	6 58	500	5 44½	500	6 41	500	500	30 4½	3,000
C. W. Wittber, 12-h.p. Wolseley... ...	4 46½	500	5 30	500	6 52	500	9 11½	308	6 41	500	476	33 41	2,784
D. McKenzie, 12-h.p. Darracq	5 47	500											
M. Fauvel, 12-h.p. Richard-Brasier ..	5 22	500	4 49½	500	9 0	300	7 59½	380					
S. W. Cox, 8–9-h.p. Talbot	5 24½	500	6 24	476	7 57	443							
Class "C."—Heavy Cars. Time allowed	5 20		6 0		6 40		5 30		6 30				
G. Hobbs, 12–24-h.p. Mercedes	3 43½	500	4 45	500	4 32	500	3 54½	500	4 39	500	500	21 44	3,000
H. L. Stevens 15-h.p. Darracq	4 18	500	4 50	500	5 41	500	5 9½	490	4 59	500	500	24 58	2,990
W. Gordon Dixon, 16–20-h.p. Talbot ...	5 12	500	5 50	500	6 26	500	5 16½	500	5 54	500	485	28 38½	2,985
T. K. Rand, 12–15-h.p. Decauville ...	4 56	500	5 55½	500	8 23	307	6 5½	464	6 54	476	467	32 14	2,779
C. E. Liddell, 24–30-h.p. Panhard ...	4 8	500	4 25	500	6 3	500	7 3½	406	6 30	500	500	28 9½	2,906
J. M. Arnott, 20-h.p. Innes	4 37	500	5 19½	500	10 0	300	6 4	466					
R. A. Duncan, 20-h.p. Oldsmobile	5 10½	500	5 50	500	6 28	500	5 37½	492					
Class "D."—Motor Cycles. Time allowed	5 20		6 0		6 40		5 45		6 30		Hill climb.		
E. James, 3½-h.p. Brown	4 9	500	4 49	500	6 18	500	5 25½	500	6 25½	500	100	26 59½	2,600
H. Jenkins, 3½-h.p. Griffon	4 54	500	5 35	500	6 26	500	6 31	453	6 37	493	100	33 3	2,446
H. H. Hutchinson, 3½-h.p. Griffon ...	4 12	500	4 58	500	6 25¼	500	7 39	386	8 30	380	100	31 44¼	2,366
V. H. Gard, 2-h.p. Minerva	4 41½	500	5 56	500	6 44¼	495	6 28½	456	8 45	365	150	32 35	2,466
B. James, 2-h.p. Minerva	4 12	500	4 45	500	6 10	500	10 28	250					
S. E. Withers, 3½-h.p. Eureka	5 18	500	8 6	374									

Tarrant), 7 points; W. R. Grimwade (10-h.p. Argyll), 4 points; and W. B. Wilkinson (10-12-h.p. Talbot), 1 point, which would result in the Dunlop Trophy going to Hobbs' Mercedes car.

Few incidents characterised the runs of the motor cycle section. On the second day, the two James Brothers, who are thoroughly used to the roads, were the first favourites, especially as Mr. B. James won the first race last year. In the event, too, the preference was justified, for Mr. E. James, in the November contest, carried off the prize. On the fourth day, Mr. B. James had to retire because the vibration had loosened his frame. Up to that time, however, he had been riding well, and at very high speed. Mr. Jenkins and Mr. Gard both lost points on this section of the run, Mr. E. James being the only competitor in his class with a clean slate.

A competition up Razorback Hill was included in the last day's run of the cycle section. The hill was divided into three successive sections and 50 marks were awarded for each section climbed. In all, the hill is nearly one mile long, and provides gradients as steep as 1 in 6. Mr. James failed on the second portion, but climbed the first and third stages. Mr. Jenkins, on the other hand, climbed all but the last part. While racing along the road after surmounting this hill, Mr. James met with an accident which partly disabled his machine; he was able to finish the contest, however, by riding very carefully, and by so doing he secured first place.

* * * *

THE 1906 THORNYCROFT MODELS.

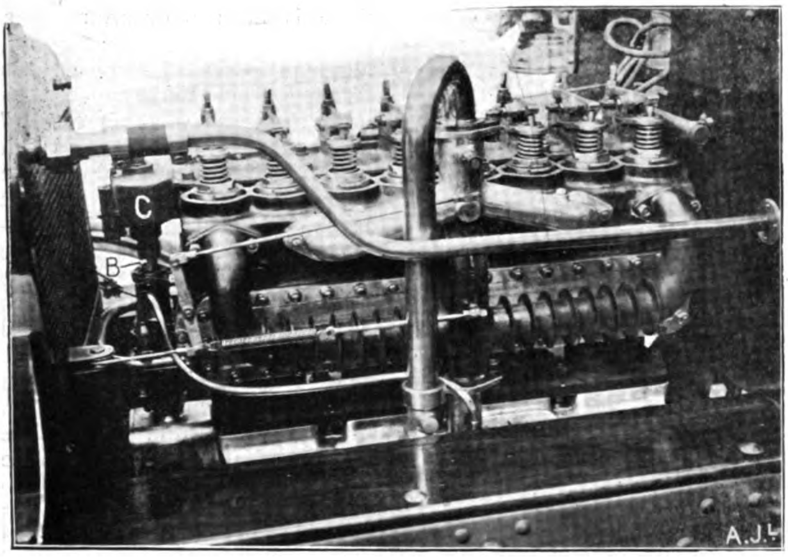


Fig. 1.—Side view of the 14-h.p. Thornycroft Engine.

Some weeks ago, in our issue of Nov. 18, 1905, we were able to give some leading particulars of the new models which this famous firm at Chiswick are constructing for the ensuing season. Supplementing that information, we now reproduce two photographs of the 14-h.p. Thornycroft engine which is being fitted to the smaller of the standard touring cars. This engine was first constructed to meet the requirements of the Thornycroft cars in the Tourist Trophy Race, and it differs in every respect from the 24-h.p. engine which is fitted to their earlier model.

All four cylinders are cast in one piece and all the valves are arranged in the cylinder-heads, where they are operated by rock-levers. Another interesting feature in the construction of this engine, and one too which renders it particularly accessible, is that the cam-shaft is arranged, alongside the cylinder-heads, in the casing, C, which is prominent in Fig. 2. Here it is driven by skew-gearing from a vertical shaft, B, which carries the centrifugal governor operating on the throttle. Mounted on the free end of the cam-shaft, and on the driver's side of the dash, is the high-tension distributor from which wires are led through a neat casing to their respective ignition plugs which project into the combustion-chamber through the cylinder walls. In Fig. 2 these plugs are clearly visible.

Bayonet socket-fittings render the valves very accessible, and indeed either valve with its seating can be bodily removed in a few seconds without dismantling anything but the rock-lever. Accessibility has always been striven after by the engineers of the Thornycroft firm, and it is undoubtedly largely owing to the extensive practical experience of Mr. Tom Thornycroft himself—who is one of the most ardent of present-day motorists—that so many interesting features have been adopted on their cars.

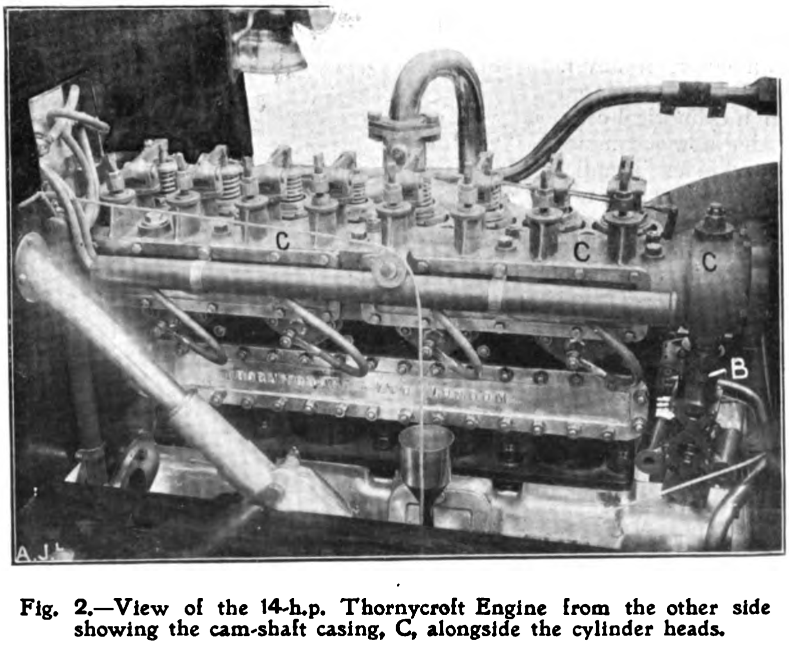


Fig. 2.—View of the 14-h.p. Thornycroft Engine from the other side showing the cam-shaft casing, C, alongside the cylinder heads.

HIGH-TENSION MAGNETO IGNITION—(*continued*).

THE EISEMANN HIGH-TENSION MAGNETO (1906 MODEL).*

EVEN though the few alterations which have been made in the new model of the Eisemann magneto are only modifications of detail construction, yet they are important, have been well thought out, and may be justly described as decided improvements.

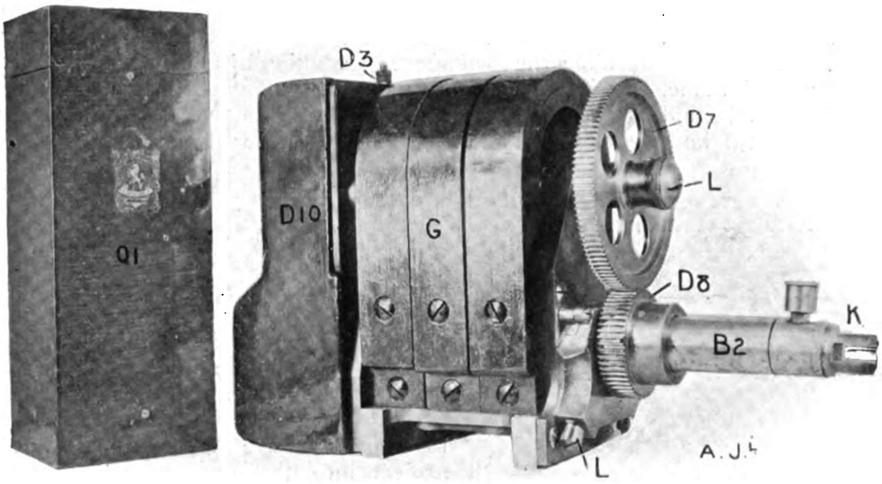


Fig. 1.—The Eisemann High-Tension Magneto (1906 Model).—View of the machine complete with its separate induction coil. The latter is now contained in a neat and substantial wooden case.

The general principle of this system, electrically, remains the same as before, while the magneto has, as is evident from Fig. 1, very much the same external appearance. The induction coil, which contains the condenser, however, is no longer enclosed in a cylindrical case, being now accommodated in a substantial wooden box.

The principal modifications have taken place in connection with the low-tension brush-gear, which has been redesigned on a stronger scale throughout. Originally, it will be remembered, the ends of the armature winding—which is still wound on a solid core—were connected to two similar slip-rings mounted on the armature spindle; and alongside these slip-rings was the contact-breaker cam. In the new model, however, the length of this end of the armature spindle has been considerably reduced by eliminating some of the members which it previously carried. Both slip-rings have disappeared, for instance, a brass knob, C^1, on the end of the spindle now constituting the live end of the primary winding, the contact-breaker cam, B^4, itself doing duty for the "earthed" connection. Even in the original machine the cam was mounted in contact with the "earthed" slip-ring, so there is no real departure from previous practice in this detail, although increased simplicity has resulted from the change. In order to ensure a thorough "earth" on to the bearing-plate, M^1, which carries the stationary side of the contact-breaker, C^3, a very neat brush, C^5—shaped like a fork—is arranged to press against the rear face of the cam. The simple method in which this device is arranged is very clearly indicated in Fig. 2.

The low-tension current is now collected by a spring contact-brush, C^4, mounted on the insulated bracket, C^6, which also carries the adjustment-screw, C^7, of the contact-breaker. The whole of this bracket can be

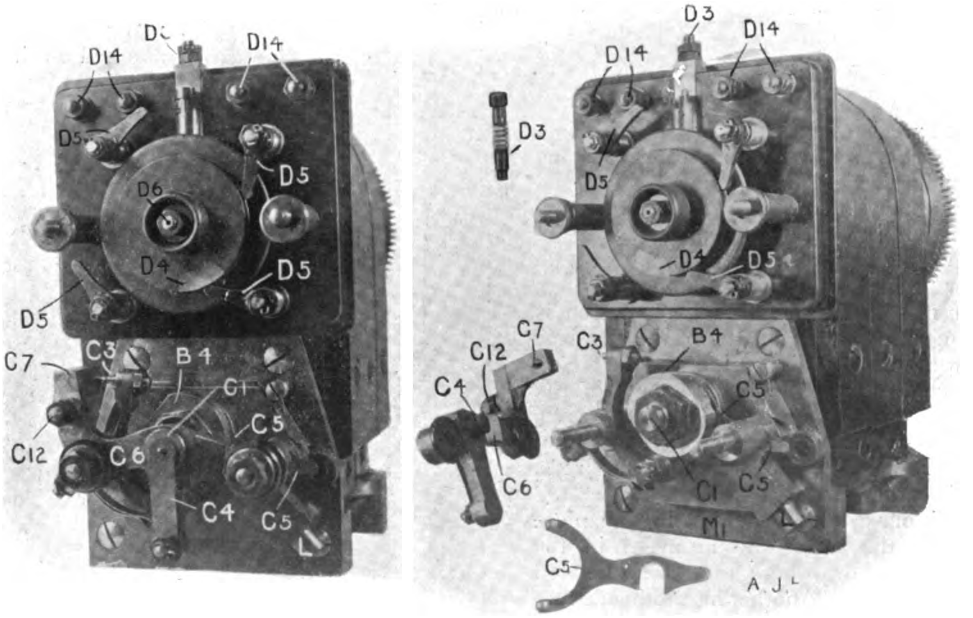


Fig. 2.—The Eisemann High-Tension Magneto (1906 Model). Views of the low-and high-tension gears showing the principal alterations in design. The low-tension gear has been entirely altered, but the high-tension gear has only been slightly modified.

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* Our original description of this machine appeared in this Journal on October 8th, 1904, and is contained in the Automotor Library, Vol. I.

instantly removed by undoing two thumb-nuts, and in the right-hand view of Fig. 2 it is shown detached. There are no similarly radical departures in the high-tension gear, but one or two slight modifications have, nevertheless, been introduced. The distributing brushes, D^5, are now made so that they will remain away from contact with the revolving distributor, and the engine may thus be run on one or more cylinders only, for testing purposes, if required. A high-tension spark will, however, take place at the safety-spark-gap on the coil under such circumstances.

Another improvement in detail is the simple bayonet socket fitting for the feeder-brush, D^3, which can now be quite easily removed for renewal or inspection.

The external connections remain much the same as before, except that there is now only one terminal, C^{12}, which need be connected to the induction coil. The induction coil has four terminals, but two of these are permanently coupled, and a wire must be led from them to the frame, for they represent the "earthed" ends of the primary and secondary windings. The live low-tension terminal, which must be connected to C^{12}, is marked, on the coil-box, "B," while the live high-tension terminal, which is connected to D^3, is marked "H." It is, of course, necessary to "earth" the frame of the magneto in the usual manner.

Lubrication is, it will be noticed, no longer effected from oil-cups mounted on the top of the magneto. The distributor-spindle, D^6, is now lubricated by oil contained in the enlarged boss of the spur-wheel, D^7, while the armature-spindle is lubricated by wicks from oil reservoirs formed in the bearing-plates.

Our present illustrations are marked with the same reference letters as those previously employed, so that comparisons between the two models may be readily made.

* * * *

THE PARSONS COMPRESSION VALVE.

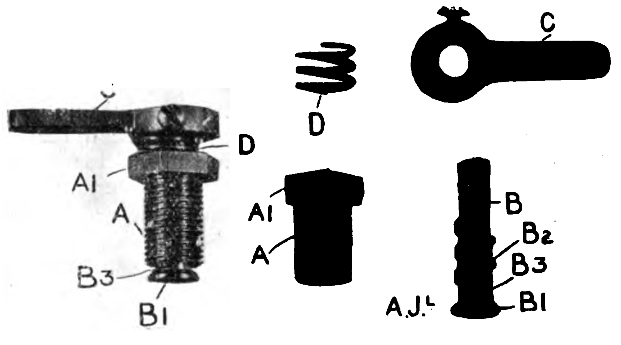


Fig. 1.—The Parsons Compression Valve. Views of the device complete, and also of its component parts separately. Escaping gases have to enter the hollow valve-spindle, B, through the ports, B^3, in order to reach the atmosphere.

VERY ingenious and very simple is the little valve which Mr. Parsons—who is already well known in connection with the heavy-oil engine bearing his name—has invented as an improvement upon compression cocks and drain cocks of the ordinary type. Our illustrations show its construction, and they also show how very easily it may be dismantled, should this be necessary. The device consists of four pieces only, a screw-fitting, A, valve-spindle, B, lever, C, and spring, D. On the valve-spindle, B, is the thread, B^2, which engages with a corresponding thread inside the sleeve, A. Instead of meshing closely, however, they are allowed a considerable amount of back-lash, and in this fact lies the whole point of the valve. An ordinary conical valve-head, B^1, forms the lower end of the stem, B, and just above this are four little ports, B^3, communicating with the hollow interior—which is open at the other end, to the atmosphere. Anything escaping or entering through the valve can, therefore, pass through the hollow valve-spindle.

Normally the valve is held against its seat by the spring, D, and it is capable of acting within the limits of the back-lash, as a simple automatic non-return valve. As such, it is particularly useful when injecting petrol or paraffin, because it prevents the liquid being blown out again during the up-strokes of the piston. When required it may be opened instantly by direct pressure, but on the other hand it may be set so that direct pressure has no effect. By means of the lever, C, the valve may be opened positively and be left open indefinitely, for the pitch of the thread is such as to prevent any pressure behind the valve from closing it automatically under these conditions.

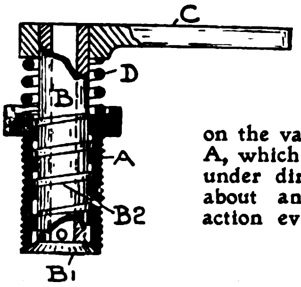


Fig. 2.—The Parsons Compression Valve. Sectional drawing showing the clearance between the threads on the valve-spindle, B, and the sleeve, A, which permits the valve to open under direct pressure and also brings about an automatic "grinding-in" action every time the valve is opened and closed.

More important still, however, is the facility with which the valve may be ground in to prevent it from leaking at any time, for the back-lash between the threads permits a partial rotation of the valve while it is still on its seat. This action, it will be noticed, can take place when the valve is in use if the lever, C, is correctly adjusted, and there is consequently a tendency for the valve to automatically maintain its seat in good condition.

* * * *

London Traffic.

AT the Monthly Dinner of the London Chamber of Commerce, taking place on February 21st, the subject for discussion will be "London Traffic." Mr. Felix Schuster, chairman of the Council and a member of the recent Royal Commission on London Traffic, will preside, and a number of well-known experts on the question have been invited to attend and speak on this subject, which is of so much interest to both the motor trade and the general public.

THE AUTO-MIXTE PETROL-ELECTRIC CAR.

Few ideas have been so persistently followed as that of combining the internal combustion engine with a dynamo, on a motor car, for the purpose of eliminating any mechanical change-speed-gear. Extremely limited success has, however, attended the numerous practical efforts in this direction, and naturally each succeeding year removes something of the urgency for such a system, because the enormous improvements which have taken place in the construction of standard petrol cars, and especially in the engines, have tended towards that flexibility of control which is the real aim of all petrol-electric combinations. Primarily, the chief stumbling-block to any such arrangement is that of weight, for the dynamo and the motors are each as heavy as the petrol engine, while the accumulators—when used—are, as everyone knows, not only heavy and bulky, but apt to give trouble as well. When accumulators are not used, a portion of the weight is saved, but one of the most important advantages—the storage of energy—is lost also, and the system is then merely equivalent to a variable gear.

Very diverse, however, have been the numerous systems adopted; some, like the Krieger, merely use the electricity as a medium for the transmission of power to the driving motors; others, like the Fischer, supplement this by a battery of accumulators, which affords a source of reserve power and enables the engine—which may be built on the small side—to be kept running always at an approximately constant speed and load. In other cases, like that of the Germain, the dynamo and motor form a compound unit which provides a gradually variable change-speed-gear; whilst in the Auto-Mixte system—now exhibited at the Paris Salon—it is the dynamo itself which is occasionally used as a motor (in conjunction with accumulators) when the engine needs temporary assistance.

This dynamo, A, is mounted immediately behind the engine, and just behind the dynamo is the main clutch, C. The armature is thus caused to revolve so long as the engine is running. A propeller-shaft transmits the power to

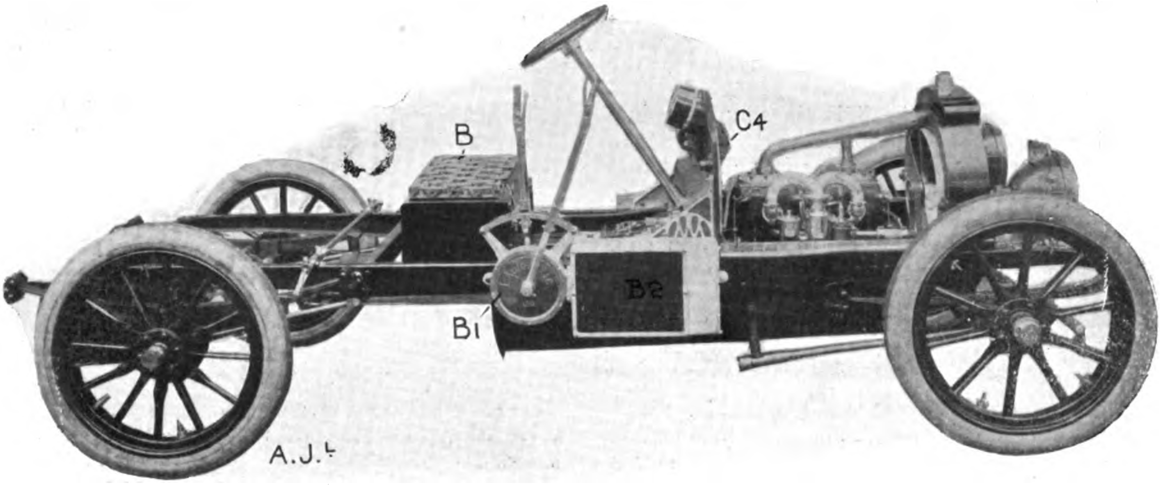


Fig. 1.—The Auto-Mixte Petrol-Electric Car. Side view of the chassis showing the position of the accumulators, B, and of the controller, B^2, which is operated by a side lever through a spur-wheel enclosed in the case, B^1.

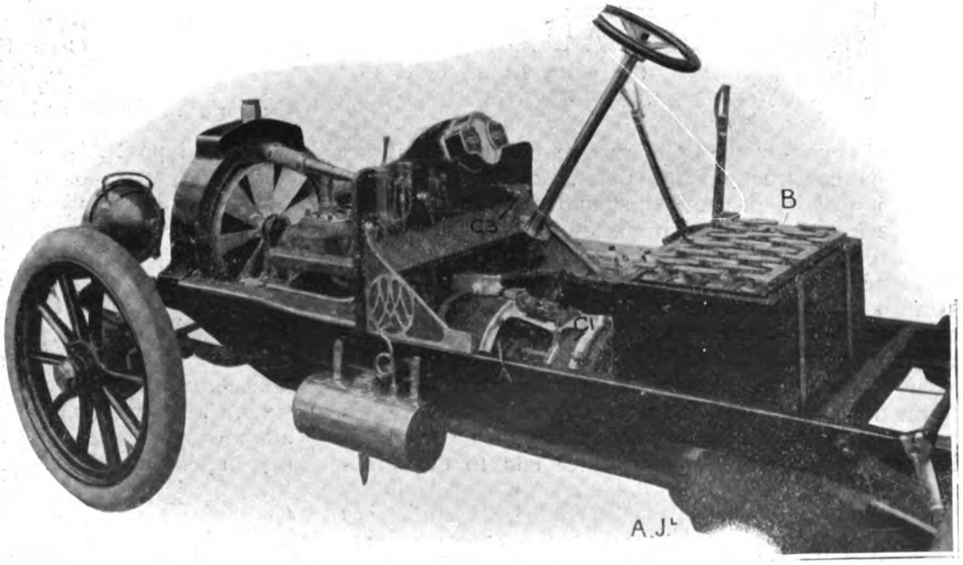


Fig. 2.—The Auto-Mixte Petrol-Electric Car. View showing the dynamo, A, which is mounted about the main-shaft and does duty for a change-speed-gear. It is always in action while the engine is running. At times it is used to charge the accumulators, but when necessary it becomes a motor, and so allows the accumulators to help the engine.

the live-rear-axle and, there being no mechanical change-speed-gear, the drive is always direct. Under the driver's seat is a battery of accumulators, B, by means of which the dynamo itself can be used as a motor whenever it is desired to increase the speed of the car or to help the engine in driving it up-hill. It also forms the only means of reversing. When not in use, the battery is charged by the dynamo if the conditions are favourable and the engine is not already fully occupied in its task of driving the car. On the Auto-Mixte chassis, the battery consists of 28 Tudor cells, these weigh 375 pounds, so that altogether the chassis weighs 2,775 pounds in running order. All the cells are coupled up in series.

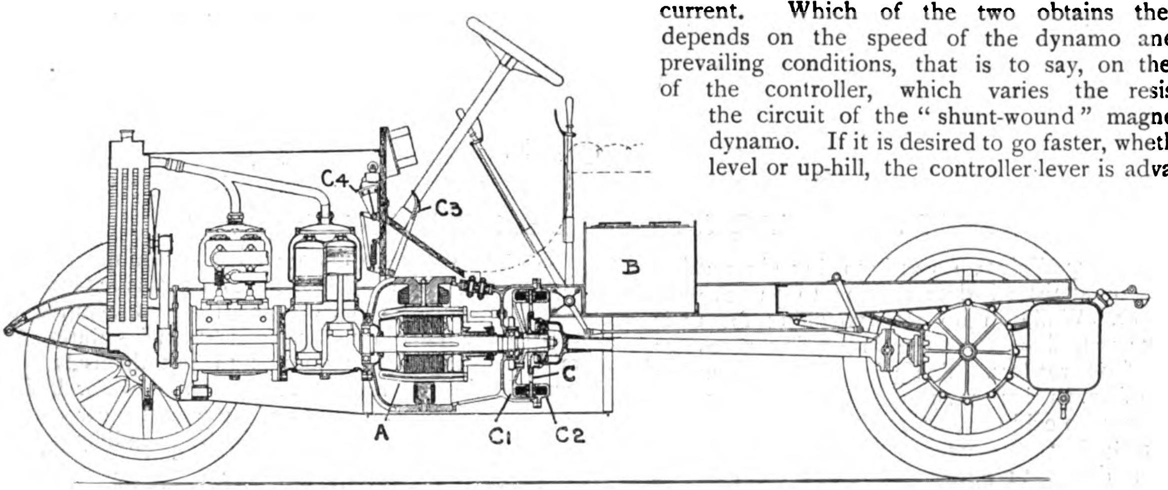


Fig. 3.—The Auto-Mixte Petrol-Electric Car. Sectional elevation showing the arrangement of the dynamo on the main driving-shaft, and also of the magnetic clutch, C, which can be used, when required, as a brake.

At the driver's right hand is a lever which operates the controller, B^2, mounted on the side of the frame, and in front, on the dash, is a volt and ampere meter which indicates what conditions are prevailing by showing whether the batteries are discharging, being charged, or are in a state of electrical rest. It will be understood that the battery is all the time trying to assist the engine by discharging its current through the dynamo—thus converting it into a motor, and that the dynamo is equally in readiness to charge the accumulators by reversing the current. Which of the two obtains the mastery depends on the speed of the dynamo and on the prevailing conditions, that is to say, on the position of the controller, which varies the resistance in the circuit of the "shunt-wound" magnets of the dynamo. If it is desired to go faster, whether on the level or up-hill, the controller lever is advanced forward, and this, by weakening the voltage of the dynamo, renders the battery more in a position to drive it as a motor. On the engine is a magnetic governor, D, which acts directly on the throttle-valve, and in conjunction with the controller is an electro-magnetic device which times the ignition. Ordinary low-tension igniters are employed, but the position of the iron core in the intensity coil of the circuit is made adjustable, and is connected to the controller lever. Altering its position varies the "fatness" of the spark, and the relative igniting powers of the "fat" and the "lean" sparks are considered sufficient to give the necessary advance or retardation.

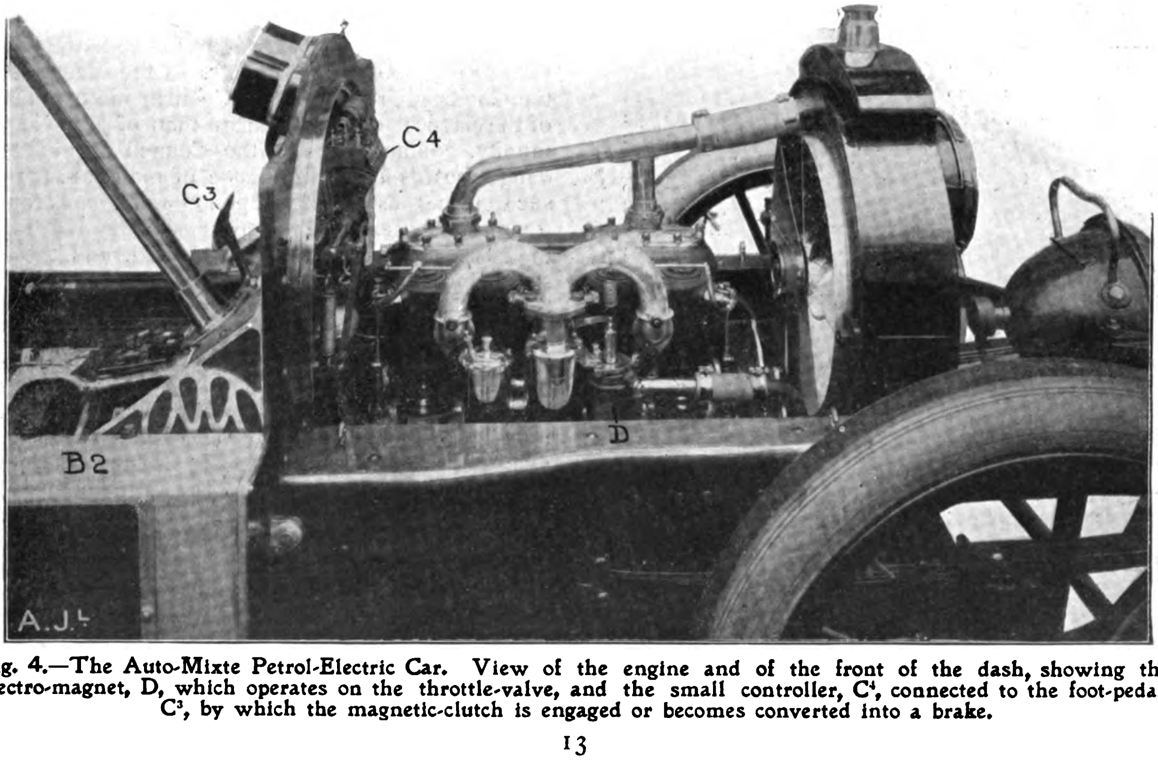


Fig. 4.—The Auto-Mixte Petrol-Electric Car. View of the engine and of the front of the dash, showing the electro-magnet, D, which operates on the throttle-valve, and the small controller, C^4, connected to the foot-pedal, C^3, by which the magnetic-clutch is engaged or becomes converted into a brake.

For controlling the electro-magnetic clutch, a pedal, C^3, is provided, which operates a small controller, C^4, mounted in front of the dash. The clutch is of the single disc type, and its arrangement is shown in Fig. 3. Mounted on the propeller-shaft is the flat disc, C, and on the engine shaft is an annular electro-magnet, C^1. When the pedal is released, current flows in the coil of wire on C^1, and the whole casting becomes a magnet, which then attracts the disc, C, and clutches the two shafts together. As on a petrol car, the clutch pedal must be released gradually—in order that the resistances in the circuit may be used with their proper effect. When pressed right forward the same pedal applies a brake, or, rather, converts the clutch into a brake, for behind the clutch, C, is another electro-magnet, C^2, similar in every respect to C^1, except that it is stationary. When energised, therefore, it attracts the disc, C, and thus retards the propeller-shaft.

* * *

STATISTICS OF THE 1905 SALON.

Our contemporary, *L'Auto*, has again made an interesting compilation of statistical data relating to the present French Show. While in no way vouching for their accuracy, we reproduce the more interesting notes for the benefit of our readers. These figures are, we understand, taken from particulars supplied by fifty-five French manufacturers who exhibited at the Salon 326 vehicles, including 148 complete cars and 178 chassis. These represent 150 different types.

The following list shows the percentage construction of cars of different powers for last year and this :—

Type. H.-P.	1904. Per cent.	1905. Per cent.	Average price (1905). Francs.
6	3	2	—
8–9	17	6	4,750
10–12	12	15	7,200
14–16	23	19	10,300
20	16	13	—
24–30	20	27	15,200
Above 35	8	18	—

It is estimated that the average price per horse-power has undergone a reduction of about eighty-five francs this year.

Various points of constructional detail are compared in the following table :—

	Per cent. 1904	Per cent. 1905
ENGINES.		
1-cyl.	6	8
2-cyl.	15	20
4-cyl.	71	71
Special	2	1
INLET-VALVES.		
Atmospheric	3	6
M.O.V.	97	94
CYLINDERS (4-CYL. ENGINES).		
Separate	35	33
Pairs	65	63
One piece	0	4
VALVES.		
Same side	24	28
Opposite sides	66	64
Inlets above	7	8
IGNITION.		
L.-T. magneto	26	39
H.-T. magneto	23	45
Magnetic igniters	0	5
Accumulators	19	11
Various	2	0
FRAMES.		
Pressed steel	76	82
Armoured wood	16	14
Tubes	5	4
Various	3	0

	Per cent. 1904	Per cent. 1905
CLUTCHES.		
External leather	60	51
Internal cone	17	15
Metallic	20	32
Various	3	2
GEARS.		
Single sleeves	—	50
Two sleeves	—	38
Three sleeves	—	12
Direct drive	—	72
Ball bearings	62	75
TRANSMISSION.		
Chain	49	48
Shaft	51	52
REAR BRAKES.		
Internal	82	91
External	18	9
Cable compensated	38	24
Beam compensated	15	29
FOOT BRAKES.		
Internal	21	25
External	79	75
On gear shaft	44	34
On differential	48	54
Various	8	12
BRAKES.		
Steel on steel	30	13
Cast iron on steel	36	51
Bronze on steel	17	31
Various	7	4

Cars and the General Election.

Any car owners who are sufficiently public spirited, self-sacrificing and politically enthusiastic to be willing to provide cars for the conveyance of voters to the polls in various constituencies during the coming election, are requested to put themselves in communication with the secretary of the Motor Union, who is organising the forces of automobile car owners in support of those Parliamentary candidates who are in favour of automobile progress. We believe it is an unwritten law of the Union in such cases that persons agreeing to lend cars will only be asked to furnish them for service at elections in their near neighbourhood, as, of course, it is not reasonable to expect a car owner to send his vehicle too far afield. At the same time there may be cases in which enthusiastic car owners will be willing to send their cars to the more distant elections which in most cases take place later. If they are sufficiently self-sacrificing for this, it will, perhaps, be as well that they should explain it to the secretary of the Motor Union.

Urban District Councils and their Work.

Local authorities so frequently regard automobilists from such a lofty attitude—*de haut en bas*, as the French say—and assume such an attitude of infallibility that few automobilists will be able to restrain a smile of amusement when they find a body of this kind "putting its foot in it" in such a way as even to excite the hilarity of their own supporters. We refer to the recent action of the Chertsey Urban District Council, more reminiscent of the classical city of Gotham than of a modern community. Some time ago the Council decided to erect danger boards for the guidance of motorists, to indicate such places as in their opinion were dangerous, and where but moderate speeds should be indulged in. Triangular devices were adopted, and these were set up at the crossing at Bell Corner and in Guildford Street. They had not been erected and duly admired by the local Bumbles very long when Mr. J. F. Ochs, of St. Anne's Hill, a well-known member of the Automobile Club, pointed out that they were put up *on the wrong side of the road*, the result, of course, being that no passing motorist would be likely to notice them. One would have thought that the Council of Gotham—we mean Chertsey—on having the mistake pointed out would at once have rectified it. Not a bit of it ! They replied to Mr. Ochs that "in the opinion of the Council the danger signals have been placed in a most advantageous position." Any people less infallible than a District Council would have admitted their mistake and rectified it. And these are the sort of people who wish to have absolute control of the speed of motor cars in their districts !

THE "AMAC" CONTACT-MAKER.

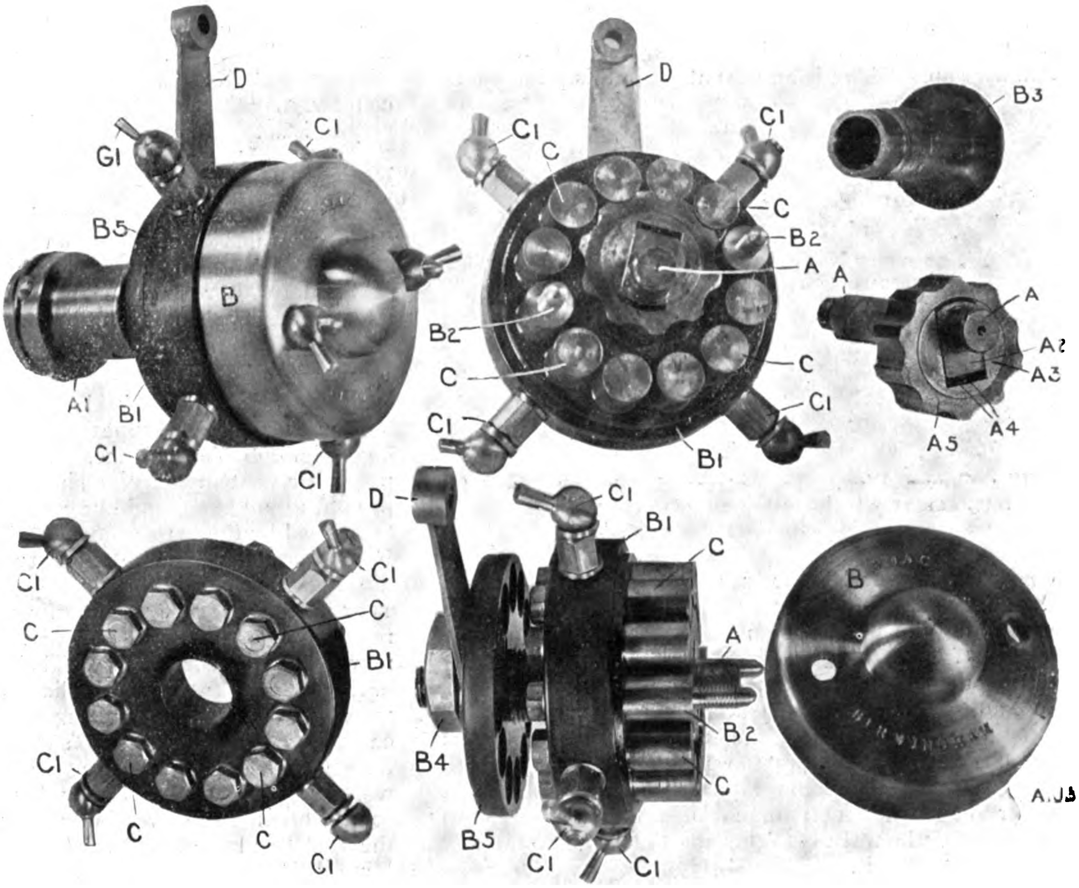
QUITE unlike the majority of "commutators" used with petrol engines is that made by the Aston Motor Accessories Company, of which we give a group of illustrations, reproduced from photographs. It is the invention of Mr. F. H. de Veulle, and is of very ingenious but simple construction, that enables all the moving parts to run in grease, while a really good electrical contact is ensured by the rubbing action of the moving part over the surface of the stationary contact-pillars.

One illustration shows the contact-maker complete with its detachable cover in place, while to the right of this view is another with the cover removed, and on the extreme right is the revolving shaft carrying its contact - making wheel, with its bearing sleeve just above it. Beneath these views are others, showing the back of the main portion of the apparatus, the entire contact-breaker partly dismantled, and the metal cover alone.

Referring to these, it will be seen that the shaft, A—which can be connected up to the engine by the coupling, A^1—is formed solid with a square carrier, A^2, and that it projects sufficiently far forward to take a bearing inside the cover, B. Engaging with the carrier-block, A^2, is a kind of eccentric-sheave, A^3, which slides over it, and it is at all times pressed outward by two small helical springs, A^4. Outside, and free to turn on the eccentric-sheave, is the contact-making wheel, A^5, which thus forms an eccentric-strap. The teeth that are formed around the periphery of the wheel, A^5, are ten in number, and their curvature is such that they fit closely up against any of the twelve brass pillars that are fixed to the ebonite plate, B^1. Owing to the action of the springs, A^4, the wheel, A^5, is always kept in contact with one or two of the brass pillars, and the effect of revolving the shaft, A, is to make the wheel, A^5, rub round each pillar in turn whilst it is passing on from the previous pillar to the succeeding pillar. In this way the grease is squeezed out from between the rubbing faces, and a good electrical contact is ensured.

Four of the brass pillars (those marked C) are provided with outwardly projecting terminals, that receive the low-tension wires for the four cylinders, but the remaining pillars are merely insulated guide-blocks for steering the toothed-wheel, A^5, in the required direction. Two of the latter, B^2, are, however, utilised for holding the cover, B, in place, these being slightly longer than the others.

The ebonite plate, B^1, has a brass bush, B^3, that forms a long bearing for the shaft, A, and this bush is held firmly in place by a pinned flange at one end and by the nut, B^4, near the other end. Behind the plate, B^1, is an ebonite cover-plate, B^5, with holes drilled in it to correspond with the nuts at the back of the plate, B^1, and this cover-plate is also held up against the main plate, B^1, by the large nut, B^4. Two purposes are served by the cover-plate, B^5, for not only does it protect the nuts inside it, but it enables the timing-lever, D, to be fixed at any convenient angle. This timing-lever is used for rocking the commutator about the shaft, A, in the usual way, and is for this purpose pinned to the cover-plate, B^5. By slackening back the nut, B^4, the plate, B^5 (with the lever, D), can be drawn clear of the pillar-nuts, and can



The "Amac" Contact-breaker, for a four-cylinder petrol engine. Views showing it both complete and partly dismantled.

then be replaced at the required angle—twelve alternative positions being available.

It will, of course, be understood that the effect of the apparatus is to alternately "earth" each of the insulated terminals, C^1, thus completing the circuit to each of four induction-coils in regular sequence. Similar contact-makers are also constructed for use with any engine having one, two, or six cylinders, and we learn that the manufacturers are also about to combine a high-tension distributor with this type of "commutator."

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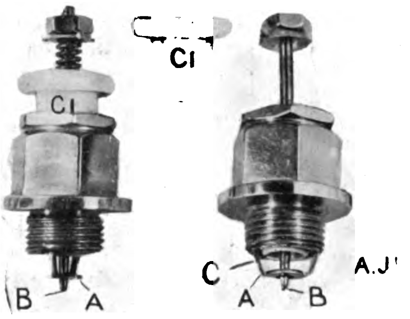
THE CROWN IGNITION PLUG.

So many different forms of ignition plugs find their way on to the market that it must now be quite difficult for inventors to discover a new design. One of the latest to come before our notice is called the "Crown," and has been sent to us by the United Motor Industries, Limited, who keep an enormous stock of plugs of every description. This particular model is principally peculiar for the form of its sparking points, which provide an annular gap. There is an advantage in this principle of construction, especially for use with magnetos, because it affords several alternate paths for the spark, thus preserving them from being burnt away so quickly. The actual construction of the plug is clearly shown by our photograph; the live terminal is simply a straight rod, and surrounding its extremity is a small ring, B. Another feature is that the upper porcelain, C^1, is detachable for cleaning purposes. In accordance with modern practice the lower porcelain, C, is tubular, in order to allow a certain amount of scavenging action to take place, which tends to prevent the formation of any permanent deposit.



The Crown Plug. Two views showing its special points, among which are the annular sparking gap and the detachable porcelain, C^1.

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Extraordinary Attempt at Municipal Extortion.

A VERY important triumph for the Western Road Carrying Company, the Motor Van and Wagon Users' Association, and the Society of Motor Manufacturers and Traders, is provided by the decision in the recent case, to which we have already referred, in which a local authority, viz., the Keynsham Rural District Council, sought to obtain damages for extraordinary road traffic against the Western Road Carrying Company for injury said to have been caused by their motor lurries. The action, which was taken under the Locomotives on Highways Amendment Act of 1878, resulted in a complete victory for the defendants, the Keynsham Council, who had been ordered by the Court to make a full disclosure of their books, failing to substantiate the damage for which they claimed. A summons was then taken out on behalf of the defendant company for the action to be dismissed with costs, and so the proceedings came to an end. There is no doubt that this attempt by the Keynsham Council was being looked upon by other similar bodies very largely as a test case, and we can hardly entertain any doubt that had the prosecution been successful it would have been followed by a regular crop of similar incidents. The Motor Van and Wagon Users' Association, as well as the defendant company and their legal advisers, and all users of heavy vehicles throughout the country, may therefore be heartily congratulated on this very satisfactory result.

By Way of Example.

THE miscreants who erected a pile of stones in the road over which Queen Margherita travelled last August through Italy, which caused a serious accident to Her Majesty's car, have been sentenced to various terms of imprisonment varying from 20 to 11 weeks.

Auto-Highwayism.

WE were always afraid that this was what would happen ever since the appearance of that fascinating but highly improbable romance, "The Motor Pirate," in the pages of a contemporary. These tales of crime always prompt to imitation, and our contemporary has evidently been read by the masses not only in this country but in France as well. We referred last week, in summarising the tendencies displayed by the automobile world in 1905, to the increasing popularity of the car, due to the recognition of its useful qualities. This recognition is now likely to be shared in social circles more regularly at daggers drawn with the police, even than ordinary motorists. Two enterprising youths of the French capital, a few days ago, succeeded in stealing a high-powered car belonging to a wealthy American resident, and with this they have been touring the roads, holding up everybody they met, and bidding them "Stand and deliver" in the good old time-honoured highwayman style. So successful were they that by the time they reached Tours the unwilling offerings of their victims amounted to as much as £300, and on one occasion they even carried off a farmer and his pig. They requisitioned provisions and petrol at their pistol's point, and goodness knows how long they would have carried on the exploiting of France had they not come a mucker into a tree, with the result that their stolen car was rendered incapable of serving them further, and once they took to the road and the railway they were easily recognised and arrested. The motor car has brought back many of the old conditions of travel of the eighteenth century. If it is to reproduce in another form the old-fashioned highwayman, there will no longer be an excuse for maintaining that it has not added to the picturesqueness of modern life, as, if the example of the two French chevalier d'industrie is at all generally followed, a good many people will be disposed to twit Lord Montagu on the blood-curdling romance that first appeared in his paper.

THE "WHITE FLYER."—THE MOTOR-DRIVEN AEROPLANE OF THE BROTHERS WRIGHT.

ANY lingering doubts that may still be entertained in regard to the reality of the Wright Brothers' performances are now likely to yield to the circumstantial report which the enterprise of our contemporary, *L'Auto*, has enabled it to place before its readers. The French journal in question, as soon as it was convinced that the rumours of successful motor-driven aeroplane flight were more than mere rumours, at once dispatched a representative (M. Coquelle) to Dayton, Ohio, to investigate matters on the spot, and this investigator has furnished to his paper a detailed account, the perusal of which goes far towards removing any doubt as to the substantial correctness of all the claims that have been made on behalf of the two brilliant experimenters, and fully establishes the general truth of the statements previously published on the subject by Captain Ferber.

This is not, however, the only confirmation of the statements we were enabled to make last week, which has since come to hand. A further report has been furnished by Mr. Weaver to M. Frank Lahm, of the French Aero Club. Mr. Weaver, it will be remembered, was some time ago commissioned to ascertain what truth there was in the various rumours, and, in accordance with instructions, he sent to M. Lahm a telegram (which we reproduced at the time) stating that the claims made on behalf of the Brothers Wright were fully substantiated. Mr. Weaver's report, dispatched by post at about the same time as his telegram, is now to hand, and fully confirms the report rendered by M. Coquelle.

The whole subject is of extreme interest, and it will ultimately, no doubt, be regarded as epoch-marking in the highest degree. We are dealing with the first reports of absolutely the first successful attempts to accomplish mechanical flight, and it is not astonishing, therefore, that a large mass of material has already found its way into the Press. The discovery of exactly what the Wright Brothers have accomplished, and its publication to the world under the circumstances, must certainly be regarded as a credit to the enterprise of French journalism.

For the benefit of our readers we propose to sum up the available data on this absorbing topic under the following headings:—

1. What the Wright Brothers have actually accomplished.
2. The evidence on which the statements are based.
3. The means by which they have effected it.
4. The reasons for their reticence.

1. What the Wright Brothers have actually accomplished.

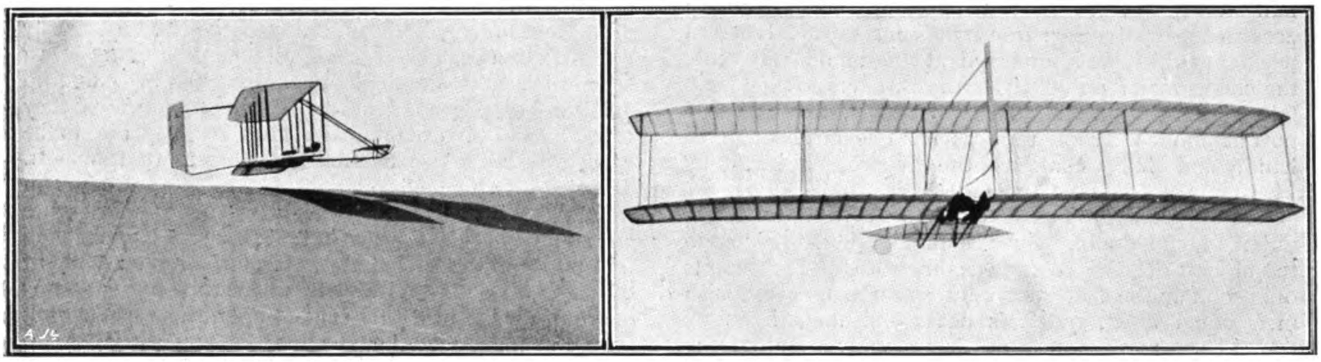
The record of actual accomplishment is shown by all the further evidence which has now come to light, to be almost exactly what it was declared to be in the letter to Captain Ferber, mentioned in our number of Dec. 9th, that is to say, they have made a large number of different flights averaging a speed of a kilometre to the minute (or not much under 40 miles an hour), and on one occasion actually covered a distance of 24¼ miles before touching ground.

These flights and experiments were carried out in a large meadow in the neighbourhood of Dayton, where on the ground of a friendly farmer the two enthusiastic aeronauts, who in Dayton and private life are bicycle manufacturers, had erected a shed for the accommodation of their flying machine. Round this patch of prairie, which was a rough quadrangle of about 1½ kiloms. in extent, flights were conducted and various manœuvres and experiments at different heights from the ground carried out. The maximum height attained was about 80 feet, and the "White Flyer" (the name the Wrights have bestowed on their machine) careered round and round the field till the various distances which we have previously recorded were accomplished. The actual distances over the ground mentioned are only approximate, for the method of calculating distance was by means of a small anemometer rigged up on the flying machine, the anemometer of course only actually recording the distances travelled through the air. Experiment, however, proved that the records substantially agreed in most cases with the distance travelled over the ground, as the flights were conducted round and round approximately the same course.

As in their gliding experiments, the recent flights of the Wright Brothers with their motor-driven aeroplane, have been extraordinarily conspicuous for a total absence of accident, due, no doubt, very largely to the remarkable mixture of bravery and caution which we have previously pointed out as characteristic of all their proceedings. In fact, in nearly all the flights they succeeded in ending up and coming to ground near the shed from which they started, and only exceptionally had the aeroplane to be carried back any distance by other means of transport. The nearest approach to an accident was on one occasion when Mr. Wilbur Wright swooped at slightly too acute an angle towards the ground, and instead of righting himself again descended abruptly amid a numerous herd of pigs, whose astonishment when this portent—this enormous white bird—descended upon them like a bolt from the blue, may be imagined. The witnesses, to whose evidence we shall next refer, and who were present at many of the actual flights executed, were most impressed, at any rate during the later flights, with the amazing manageability of the machine. It moved up and down, executed turns and figures exactly as the aeronaut managing it desired, and on one occasion performed an almost exact figure of eight inside a square of some 400 metres. Wilbur and Orville Wright, as in their gliding experiments in North Carolina, managed, rode, or flew (whichever expression is preferred), the machine alternately. The last splendid flight on the 5th of October, of 24¼ miles, was really only brought to a conclusion by the exhaustion of the petrol supply for their motor.

2. The Evidence on which the Statements are based.

The campaign of experiment for the year was brought somewhat abruptly to a conclusion with the last great flight of October 5th, owing to the fact that one of their friends who had been privileged to witness previous experiments, although "straitly charged not to do so," had been talking rather big about the wonderful things that he had seen. The consequence was that a large detachment of Daytonians assembled on the ground, to the great annoyance of the aeronauts, who, from reasons to which we shall refer later, were still anxious to avoid anything in the nature of publicity. They accordingly decided to bring their experiments for this year to a conclusion somewhat sooner than they had intended, and dismantled their aeroplane with a view to thoroughly overhauling it and introducing various improvements. M. Coquelle consequently was unable to see anything more than the parts of the machine which has established these wonderful records, and had to derive what consolation he might from inspecting the shed from which it had repeatedly issued to its triumphs. But he was able to collect very thorough evidence while in the district from a number of trustworthy people who had witnessed the flights. The first of these to whom he betook himself was a resident in the neighbourhood of the "scene of the exploits," who discharges the functions of a Justice of the Peace, Mr. M. D. Beard. He bore witness to having seen the Wright aeroplane manœuvring above his property with what he described as extraordinary ease, and he felt convinced that the intrepid manipulator was not in the slightest danger. Practically the same statements were made by Mr. Beard to Mr. Weaver, who, as we have above explained, investigated the question independently, and to his name may be added that of Mr. W. C. Foust, of Dayton. Altogether, there are some seven independent witnesses whose names have been collected, and who are prepared to vouch for the correctness of the reports furnished.



The Brothers Wright's Aeroplane with which they successfully accomplished glides of nearly 300 yards in the Devil Kill Hills in 1903.

3. The Means by which they have Effected It.

No photographs or authentic reproductions or representations of the actual motor-driven aeroplane with which these flights were accomplished have, as far as we are aware, been made public, though a sketch has been published which must be regarded as mainly imaginary or ideal, as the machine was admittedly taken to pieces at the time of M. Coquelle's visit. By drawing attention, however, to the differences between the motor-driven machine and the aeroplane with which the long glides of 1902 were effected, a general idea of the structure of the machine can easily be formed. For this purpose we reproduce the illustration of that machine which we gave on Feb. 6, 1904. It will be remembered that in general outline it resembled the aeroplane of Mr. Chanute, without the polyhedral tail. Instead, it was provided with a vertical tail at the rear for steering sideways and keeping the machine "on a level keel," and a small plane mounted in front, the angle of which was controlled by the operator by means of cords. In gliding from a height, the way this machine was manipulated was as follows:—If the downward tendency was too great, the front movable plane was slightly elevated, causing the whole machine to rise against the wind. If the wind were raising it too much, the movable plane was accordingly depressed, tending to cause the front of the machine to dip deeper into the air and swoop towards the ground. If what Mr. Chanute terms "a whirling billow of air" tipped up one or the other side of the machine, this was corrected for by movements of the vertical rudder, causing the aeroplane to swing round like a bird executing a curve, and so bring the depressed side up level again.

The motor-driven aeroplane with which the successful flights of the present year have been conducted closely resembles the gliding machine which we now reproduce, excepting of course that it has a motor and propellers attached. There are, however, other differences. Instead of the single guiding or controlling movable plane in front, there are two of them mounted, one above the other, and somewhat higher in position. Similarly the tail has been duplicated, there being now two tails, a couple of yards apart, behind each of the propellers. The general dimensions of the aeroplane are slightly greater than the gliding machine, being now 40 ft. from tip to tip, the large planes themselves being 6 ft. wide, and separated from one another by a space of 6 ft. The number of vertical struts also has been increased. They are stayed and reinforced by diagonal piano wires, and the whole apparatus made very strong and rigid. There has been no attempt to sacrifice everything for lightness. The motor is mounted at the extreme rear of the lower aeroplane. It is a 4-cylinder machine, constructed by the Wright Brothers themselves, and presenting much similarity with a 4-cylinder Pope-Toledo motor of the same power, viz., 24-h.p. The two propellers are mounted about half-way between the upper and lower planes close to the rear struts, being stayed to the corresponding front struts, and are chain-driven from the motor, revolving at a very high rate of speed. The struts of the whole machine are formed of birchwood with light canvas to form the gliding surface. As in the guiding machine the aeronaut lies prone, his chest resting on a cushion, and his head just below the two movable guiding planes, his feet not being very far in front of the motor. To produce proper balancing, a dead weight of some 50 lbs. is attached to the front part of the aeroplane to assist in counterbalancing the motor, which weighs some 250 lbs. In a recent statement, signed by both the Brothers Wright, they observe that no special pains have been taken to render their machine exceptionally light. The motor is no lighter than usual, and the whole thing is very solidly and firmly made. As at quite ordinary speeds they find that it is possible to lift and maintain in the air 66 lbs. per h.p. and very much more at higher speeds, this is quite credible and shows pretty clearly that as far as mere engine power is concerned, flying has been possible for many years past. It is skilled manipulation of the machinery which has been wanting.

It will be obvious from what we have said above, and what we have on previous occasions put before our readers, that the greater part of the conquest of the air, which the Wright Brothers have effected, was accomplished when they learned successfully to perform their record glides with the machine which we formerly illustrated and now again reproduce. They made no secret at the time, and authorities on the subject like Mr. Chanute have been always fully convinced, that their success in gliding was due partially to the horizontal position of the aeronaut—a position, by the way, which it requires at first, at any rate, considerable pluck to assume—and the arrangement of the subsidiary planes, particularly the movable and controlling front plane. When a machine of this type had proved to be repeatedly capable of performing glides up to nearly 300 yds. in length against a moderate wind by being simply started from the top of a hill, it was obvious that with motive power sufficient to represent the wind, and but a little extra power sufficient to represent the effect of gravitation, extended flight would be possible, and that the manipulation and management of the machine would not be greatly different, and this is what practice has proved to be the case. The really important elements of their invention therefore, consist of these three things, and we put them in order of increasing importance—the horizontal position of the aeronaut, the vertical tail or tails, and the forward approximately horizontal controlling plane, or planes. There may be other things which we do not know of as yet, but it is obviously those elements which have, so far as can be judged, made the difference between the extraordinary success which the Wrights have accomplished, and the ignominious failures which have been the record of practically everybody else.

The absolute control and manœuvrability of the machine, together with the degree of safety attained, are well illustrated by the fact that on one occasion when the engine stopped, the aeroplane glided slowly and quietly to the ground without occasioning the slightest trouble or the slightest injury. In fact, their regular method of coming to earth is to stop the engine some little time before they intend alighting and then to glide down.

A few words should be added regarding the method of starting adopted. The two guides or supports, which are clearly shown underneath the old aeroplane, and which are preserved in the motor-driven machine, are mounted on the top of a triangular little trolley, which runs on wheels on an ordinary rail. The aeroplane is mounted on this and held steady while the aeronaut assumes his recumbent position. The motor is started, the propellers begin to revolve, and the aeroplane runs down the rail on its carriage, being held straight by an assistant operator for the first few yards, and then as it gathers speed it rises in the air (leaving its carriage behind it) "as easily and gracefully," said one of the eye-witnesses, "as a butterfly."

4. The Reasons of their Reticence.

There remains to be considered the extraordinary reticence of the Wrights in regard to their marvellous experiments—a reticence so remarkable that it has surrounded the whole of their proceedings (since in 1903 they packed up their first motor-driven aeroplane and "went home convinced that the day of flying machines had come") with an atmosphere of distinctly piquant — not to say irritating — mystery. It is so opposed to the usual American methods, though it must be admitted that it is not opposed to the previous record of the Wright Brothers themselves. The public generally knew absolutely nothing about their experiments on North Carolina Beach at Kittyhawk until they described them in the *Journal of the Society of Western Engineers.* Probably it was their intention to electrify the world when they were quite satisfied with what they had accomplished at Dayton. A remarkable point is that they apparently have ***not been satisfied.*** This is in part, we believe, due to troubles, if they can be called troubles, with their motor, which developed some very troublesome idiosyncrasies. It gave 24-h.p. quite regularly on the bench for apparently as long as they cared to run it, or at any rate for as long as it had been run. It also apparently gave 24-h.p. when mounted on the aeroplane, and when flight commenced. It kept up its full power fairly well for a quarter of an hour or twenty minutes, and then gradually fell off to about 14-h.p. This, no doubt, has prevented their giving such practical demonstrations of the art of flying as they would have wished. Probably also there are considerations of patents. On reflection, we are disposed to rate very little the suggestions put forward by M. Archdeacon and others, that the Wrights have nothing patentable, and that their success is entirely due to their skill. It is mainly due to their skill, no doubt, but it is impossible to deny that it is also due to a very large extent to the improvements in construction to which we have referred above. These are ingenious, they are decidedly novel, and they have produced a new and useful effect never before approached. If this is not good subject matter for a patent, we would like to ask what is? From this point of view, of course, a motor-driven aeroplane would come under any patents they may have taken out for the gliding machine we illustrate. But that ought to be protection, ample and sufficient. That they may have made other improvements of distinct importance, and that they wish to be fully protected is but probable. These considerations would alone be sufficient to explain their reticence. Further reasons may be their natural disinclination to have experiments, which they still obviously regard as only tentative—"the things they have done but earnest of the things that they will do"—witnessed by a gaping and unsympathetic mob.

How far they have gone in the effort to secure secrecy and prevent premature publication of their doings has been shown by an incident unearthed by the enterprising M. Coquelle. It appears that the *Dayton Daily News* had a sensational article already in type last September, describing the Wrights' experiments. It was only with great difficulty that they succeeded at the last moment (for a consideration) in preventing its appearance. M. Coquelle actually obtained possession of a copy of this suppressed paper, containing the report to which we refer, provided with the following headlines:—

"Victorious Experiments of Flying Machine."
"Wright Aeroplane comes safely to Earth after a
Remarkable flight near Dayton."

The whole article was some fifty lines in length, and was illustrated by portraits of the two Wrights. Its existence surely is the most complete confirmation, if any were needed, of the evidence we have brought forward above.

In any case, whether Governments are generous or stingy, and whether patents have been applied for or not, their unique skill, if they are willing to condescend publicly to exhibit their prowess in Europe or America, ought certainly to ensure them an ample return for the rest of their days. And there is every reason to believe that they also regard the honour of having been the first to solve the problem of the ages, as no small part of the reward they have so justly earned.

AERONAUTICS.

Mr. Wilson Again.

CONSIDERING the present position of the free flight question, the statement put forward by Mr. Wilson (who, it will be remembered, has recently occupied himself with experiments at Wembley Park of a more or less *opera bouffe* character) that he is *determined* to start within a few months on a voyage in his new "Clipper of the Clouds" from the Watkin Tower, has a distinctly comic significance.

Milan Exhibition Prizes.

IN connection with the Milan Exhibition of 1906, considerable sums are to be dedicated to prizes for aeronautical competitions. These will involve all sorts of appliances from navigable balloons to kites, and the highest prize of 50,000 lire is offered for a dirigible airship, while the next prize of 10,000 lire is for a competition of flying machines furnished with motors and carrying an operator. One would rather prefer that the relative value of the prizes were reversed, for though it is not stated, it appears to be understood that the dirigible airship competition is confined to navigable balloons. There are also competitions for which prizes of 2,000 lire will be offered for "flying machines"—that is, of course, gliding aeroplanes without motors.

Rushing the North Pole.

WHENEVER an aeronautical triumph is chronicled, one always hears of some enthusiast or self-advertiser determining to reach the Pole by means of the new locomotion. The Knabenschue dirigible balloon has been exciting a good deal of interest in the United States, and one of the results has been that a certain Mr. Walter Wellman, of Washington, a correspondent of the *Chicago Record-Herald*, who has, it is stated, made two successful trips to Polar regions, has decided on an attempt to reach the North Pole by means of an airship of the Santos Dumont type. It is to be 196 ft. long and 49 ft. in diameter, and will have a capacity of 226,000 cubic ft., being capable of carrying a total load of 15,300 lbs. It is anticipated that it will be able to maintain itself in the air for 30 days, and carry an 8,000 lb. cargo. The airship, it is stated, is to be designed and run by M. Santos Dumont himself, to be built by Godard, of Paris, to be ready in the month of April, to be at the headquarters of the expedition at Spitzbergen in July, and to reach the Pole with Mr. Wellman at—some subsequent date.

* * *

Lord Justice Fletcher Moulton.

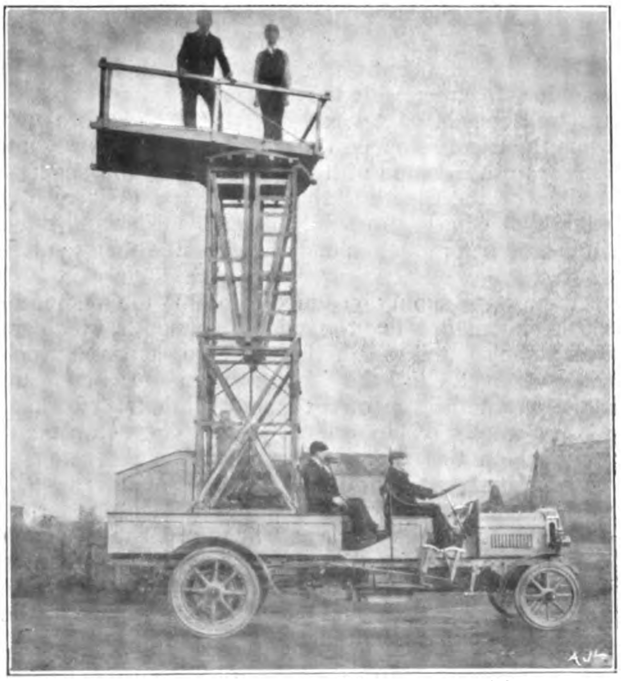
EVERYONE connected with the engineering industries will join in congratulations to Mr. Fletcher Moulton, who so recently gave his inspiring speech upon the *pros* and *cons* of the motor car, on his appointment as Lord Justice of Appeal. The appointment of a barrister direct to the Court of Appeal, without having been previously made an ordinary judge, is a high distinction, though no one will for a moment dispute that in Mr. Fletcher Moulton's case it is fully and completely justified. He is admittedly our highest authority on patent law, and a man of high scientific attainments. As he is also possessed of great legal knowledge and astonishing forensic ability, his practice has undoubtedly for many years been one of the most lucrative at the Bar. The new Lord Justice, who was educated at Kingswood School and St. John's College, Cambridge, is one of the few examples of Senior Wranglers who have distinguished themselves subsequently, as he gained this high distinction in the old days when the acquirements of a Senior Wrangler were considerably different from what they are at present. His attractive and humorous personality will, however, doubtless be seriously missed by brother barristers in the Patent and Chancery Bar.

Motoring Burglars.

AFTER the exploits of the auto-highwaymen to which we refer this week, the performances of the auto-burglars who burgled up at Great Wigston, near Leicester, from a motor car, read rather tamely. Nevertheless these also were scientific and progressive gentlemen, more scientific in some respects than the French auto-highwaymen, for besides their automobile they had one of the finest assortments of burglars' tools ever seen, and such was their skill and address that they succeeded in boring fourteen holes in a modern up-to-date safe.

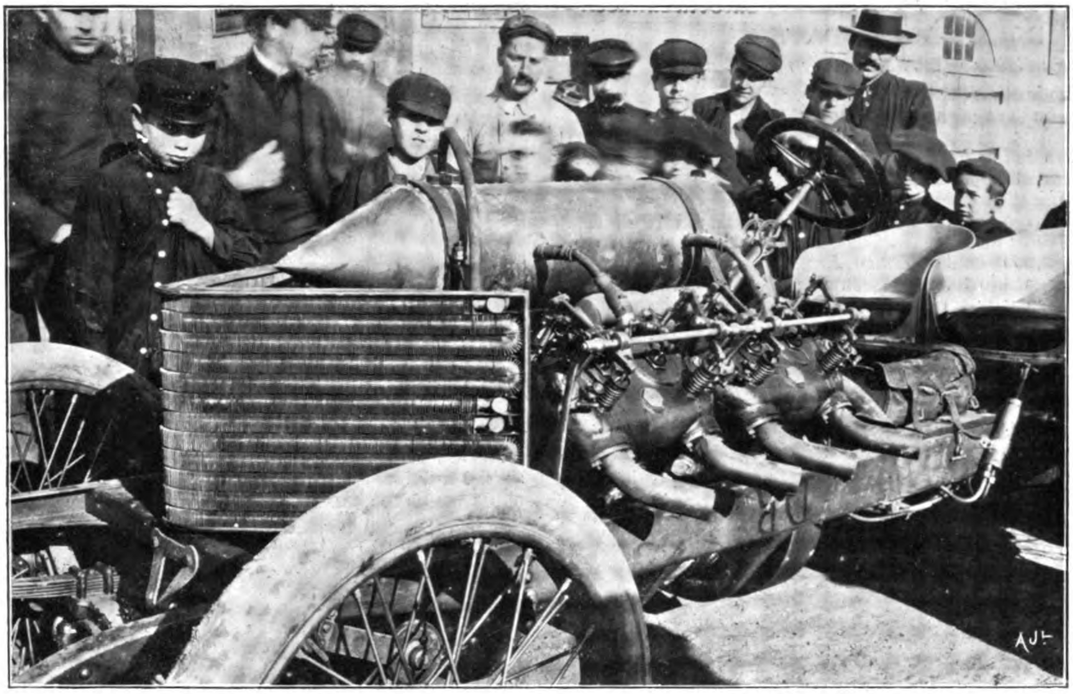
Royal Patronage.

THE German Automobile Club has been granted the patronage of the Kaiser, and has been authorised to take the title of the "Kaiserlicher Automobil Club."



It is a significant fact that even the Electric Tramway turns in distress to the Motor Car, for most of the go-ahead Tramway Companies now employ Motor-driven Power Wagons for the repair of their trolley wire. We give an illustration of one of these vehicles which has been built by the Lancashire Steam Wagon Co. for the Belfast Corporation.

RACES, RECORDS, AND TRIALS.



View of the 200-h.p. Engine in the Darracq Racer, with which Hemery last week broke the world's flying kilometre speed record. Four cylinders of 170 mm. bore by 140 mm. stroke are placed diagonally on each side of the crank-chamber, those opposite one another operating in pairs upon the same crank pins. The inlet-valves, placed centrally above the cylinders, and the exhaust-valves, which also project upward from the cylinder heads, are all operated by their push-rods through small rock-levers. Above the engine is seen the water tank, with the V-shaped radiator in front of it; the petrol tank is fixed behind the seat. With its wire wheels, shod with Dunlop tyres, this fast machine weighs 990 kilogs.

Flying Kilometre World's Record.

ON November 18th and 25th last, in dealing with the official Continental record of 23 seconds for the flying kilometre made by F. Dufaux at Ostend, we incidentally drew attention to the fact that the world's record still remained with Clifford Earp and his 6-cylinder Napier with 21⅖ secs., although this time had been also attained—unfortunately on an "unofficial road"—by Baras, on a Darracq car. We pointed out that until the "time" had been repeated by a Darracq car on the same road (the Arles-Salon, which had since received official recognition), it could not rank as an official world's record. The Darracq firm have evidently taken the hint, as last week, by way of a brilliant wind-up to 1905, Hemery, on a 200-h.p. Darracq car, not only scored the necessary time, but went a good deal better, he being timed for 20⅗ secs. = 174·75 kiloms. per hour! (108.5 m.p.h.). Hemery made four tries, and in one of these came within one-fifth of a second of repeating his record time. The car was a special racing monster weighing 990 kilogs., fitted with two 4-cylinder 100-h.p. motors, coupled in V-form.

The "Grand Prix de l'Automobile Club de France."

IT is under the above name that the big French racing event for 1906 is to be officially known. The choice of a circuit is still a very vexed question in France. The Fontainebleau district is a first favourite, in spite of municipal baits, in the form of big cash subscriptions being offered to procure the adoption. In principle, the rules will, of course, be based upon those put forward last year when the Grand Prix was first mooted. Three cars only of the same make will be permitted, whether entered by the manufacturers or others holding sub-licences to manufacture. A very drastic alteration is proposed in the rules hitherto governing the renewals of tyres, replenishment of petrol, oil, spare parts, &c. These, it is said, will only be permitted at fixed official points, and all changes of tyres, &c., must be made by the driver and mechanician *only*.

Hydra Cup.

HITHERTO this cup has been offered for motor cycle record times over 100 kilometres on the track. At a meeting of the Hydra firm, the donors of the cup, it has been decided to offer it for competition to 1-cylinder voiturettes, with a maximum cylinder capacity of one litre, and of a maximum weight, including the carriage body and magneto, of 350 kilogs. Two seats must be occupied in the trial, representing a total ballast weight of 140 kilogs. The contest is to take place over a distance of about 300 kiloms. in one stage. The winner cannot be challenged for the period of one month after securing the cup. This is a consideration, as the holder receives 10 francs a day until his time is lowered. The entry fee is 50 francs. Only two cars are allowed for each maker. The opening contest will probably take place in May.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

DIRECT-DRIVE PATENT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We notice that the Renault Company are apparently proposing to take action against those of the trade who are using the live-axle and shaft transmission, claiming to possess a master patent upon this system dating from February, 1899. We also see that the Whitney patent of 1898 is being quoted as anticipatory of the Renault, but, if it is of any use to those in the trade who are using this system of transmission, we can inform them that a still earlier anticipation is to be found in Mr. Chas. E. Duryea's car, which won the Chicago 2,000 Dollar *Times-Herald* Race in 1895. This vehicle was designed in 1893, and completed in the following year. It was fitted with gear transmission, giving three speeds forward and reverse, with live axle and bevel gear, practically the same as so largely in use to-day. Mr. Duryea abandoned it the following year in favour of belt transmission, which at that time was being asked for by the public, and subsequently finding the direct chain transmission superior to either, he never went back to the shaft and bevel gear, but photographs and drawings can be produced at any time should they be needed for the protection of the British industry in the matter.

Yours faithfully,
FOR THE DURYEA MOTOR COMPANY.

Coventry, Dec. 30th.

A RACING PROPOSITION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Is it not possible now to put the "improvement of the breed" idea out of its position of monopolist of racing interest, and to run races for *sport* and pleasure? I can remember years ago Mr. Edge advocating *small car* races, cars of, say, 6-h.p. only, and built or racing—sort of half-raters, as it were.

The classification could be very simple, say, maximum piston area and minimum weight, as the conditions would be the same for all.

The initial expense of these small cars would be small, and their running expenses ditto, so that many could afford to participate.

With such small cars it might very well be possible for the A.C.G.B.I. to get permission to race round one of the many large parks occasionally, or it might be possible to build a track, without very great expense, of ordinary road material, and about two miles in circumference.

Track racing has been going on for some time in America, but the want of limit to size of car has made it the sport (?) of professional drivers paid to take great risks.

Though I suggest that "improvement of the breed" should not enter into the framing of the rules, I feel quite sure that some very useful information would be obtained from these miniature racing vehicles. I don't think racers of any sort can be built and run without useful information resulting.

There is one other result which might have far-reaching effects, viz., encouragement and work for the small makers. Doubtless many amateur drivers would have ideas of their own for the improvement of their racers, and in some cases would like the entire car built to their ideas. This is where the small makers with original ideas would score, as it is well known that big manufacturers with order books well filled with orders for standard goods object very much to building special lines or departing from their standards. Why not in addition to promoting sport, also encourage the man of original ideas?

Yours faithfully,
ERNEST H. ARNOTT.

Jan. 2, 1906.

6 CYLINDERS v. 4 CYLINDERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We have read with interest Mr. Edge's letter on 6-cylinder cars, and desire to endorse what he says with reference to the advantages of six cylinders. While every credit should be given to Mr. Edge as the first seller of 6-cylinder cars, there are others who were not slow to recognise the merits of the 6-cylinder motor.

In 1904 we decided to build 6-cylinder motors, and exhibited our first 6-cylinder motor at the Paris Exhibition of that year.

The 6-cylinder Rolls-Royce has, we are glad to state, created a reputation for itself which is second to none, and we can endorse Mr. Edge's statement that the difficulty is not to procure orders, but to produce cars in sufficiently large numbers to satisfy the demand that there undoubtedly is for good 6-cylinder automobiles. So much so is this the case that we are engaged with arrangements for considerably extending our works at Manchester, with a view to still further increasing our output.

We have, from time to time, given drives on our 6-cylinder cars to our friends in the automobile trade, and, as a result, we think we can point to more than one instance in which traders who were formerly engaged in the sale of foreign-made cars are now engaged in producing 6-cylinder British-made motors.

It is true that our output and that of other manufacturers of 6-cylinder cars in this country may up to the present be small, but this is a misfortune which can be—and doubtless will be—remedied very shortly. We hope, therefore, that Mr. Edge, when writing in future of the 6-cylinder movement, will not overlook the fact that other British firms have for some time past been engaged in making and selling 6-cylinder cars which have proved highly satisfactory to their purchasers.

Your obedient servants,
C. S. ROLLS AND CO.

December 30, 1905.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I do not know whether your correspondent, Wilfred Dawson's letter is inspired by Mr. Edge or not, but it looks suspiciously like it. I have been following most carefully the letters appearing on the 4 *v.* 6-cylinder controversy, and I would point out that the objection made by Mr. Jarrott, the length of wheel base of the 6-cylinder car, has been carefully left unanswered both by Mr. Edge and his other correspondents. It must be admitted that the 6-cylinder engine is one-third *longer* than a 4-cylinder one, and, therefore, if the design of the car is on the principle of proper distribution of weight over the four wheels, then the front wheels of the 6-cylinder car have to be carried forward, correspondingly increasing the wheel base nearly one foot, a very considerable amount in these days, when we are trying to keep wheel bases as short as possible. A very noticeable example of this was shown on the Panhard and Levassor stand at Olympia this year. The 6-cylinder car exhibited by that well-known firm was of colossal length, and was almost as long in *front* of the dashboard as it was *behind*.

Therefore, I think Mr. Jarrott's contention was a very obvious one, and certainly one with which I am in full accord. Six cylinders do mean an increased wheel base.

The 6-cylinder Napier must be badly designed if the front wheels have been brought back as suggested by your correspondent, thus throwing *all* the weight of the motor on these two steering wheels, and at the same time making the car resemble in appearance those ungainly-looking motor omnibuses—some of which are on the streets—which have two feet of bonnet projecting in *front* of the front wheels.

Yours truly,
H. GLADSTONE COLEBROOK.

Guildown, Coolhurst Road,
Crouch End.

THE NEW TOURIST TROPHY REGULATIONS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The inefficiency of the steam engine, as compared with the internal combustion engine, has provoked much amusing discussion in connection with the Tourist Trophy regulations, and I have just seen your issue of the 16th inst., on my return to London.

My old friend Mr. Coleman, of the White Company, seems to have taken personal offence because I asked a friend of his it he could account for the Club's proposal to allow a specially large consumption of fuel for steam cars in any other way than that they (the committee) realised the inefficiency of the steam car system.

To use Mr. Coleman's own words, he "apparently does not think. . . ." his friend "sufficiently capable" of replying, and he has come into the lists to defend him.

It seems to me useless in these modern days to discuss at any length the relative efficiency of the internal combustion and the steam boiler systems, *i.e.*, the direct and the indirect methods of obtaining power from fuel, for no amount of talking or writing round the point can, of course, alter the known facts.

The only point was whether steam cars and petrol cars should have a different allowance according to their respective efficiencies, *i.e.*, whether the Tourist Trophy Race should be a handicap; this would be perfectly fair if the Tourist Trophy were purely a sporting event of no commercial value, but the best horse can only be proved by a scratch race, and the only fair way to run an event such as the

Trophy Race is to let everyone go in on equal terms and not to favour either one system or another.

To favour steam cars by allowing them a special advantage over petrol cars would be decidedly unfair on the many engineers who, on account of its greater efficiency and other advantages for road locomotion, have developed and perfected the internal combustion engine for our use.

Personally, I should be interested to see the race run on a basis of price instead of quantity of fuel, but this opens up a new question which presents difficulties such as the possibility of a car winning the race which, on account of smoke or smell when "running light" would be quite unsuitable for ordinary use. Nevertheless it is hoped that this method of limitation, which has already been proposed, will be considered by the Club with a view to its adoption another year.

The question of the best basis—quantity or price—is well worthy of discussion, but whatever basis is adopted from year to year, it should in my humble opinion be the same for all systems—whether efficient or inefficient.

Yours truly,

CHAS. S. ROLLS.

29th December, 1905.

BRITISH *versus* FOREIGN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I read only last week a speech made by a well-known agent for the sale of a well-known British car, and as I had only just returned from the Paris Salon it was particularly interesting to me as it touched upon that very much discussed question, "Should foreign cars be taxed?" The individual in question was addressing a number of—presumably—working men, and he was lamenting the fact that a grave injustice was being done to the working men of England because perfidious and clever foreigners were allowed to import cars into this country free of duty, and in return, would allow no English cars into their own countries without payment of a certain customs duty.

As a result of this the aforesaid and ill-used agent could not compete with his British-made goods in the aforesaid foreign countries and had been compelled to erect his own (*sic*) factories in certain foreign countries he mentioned in order to meet the foreigner on his own ground and on his own terms. All this and much more on the same lines was held forth, it being most carefully omitted that if foreign cars *had* been taxed in the past the motor industry in this country would have been, and would be now, considerably retarded. The real fact that instead of erecting his *own* factories he had induced enterprising foreigners to build *their* factories and take a licence from him for manufacturing the cars in which he was interested—thus putting money into his own personal British pocket which would otherwise have been diverted into other sources—did not come within the knowledge of the audience, so the point was allowed as a fair argument.

I do not wish, Sir, to start a discussion in your journal on "protection," but a certain section of the motor industry in this country is so complacent on its position that I would like to mention a few hard solid facts for its benefit.

The British firms showing at the Paris Show this year numbered three, viz., Argyll, Star, and Wolseley, and I think these firms are deserving of the highest praise for their representation of the industry in Great Britain. At the same time, I do not suppose that they went there because they expected to find a large number of foreigners buying their cars. The idea was rather to emphasise their position as being three of the leading English firms, and the policy was undoubtedly good and correct. I believe that at least two of the firms have representatives in France, and consequently do a certain amount of business there. Anyhow, no one can say that the demand for English-built cars abroad is very great.

And, as outlined in the earlier part of my letter, we are asked to believe that this is due to the fact that a duty has to be added to the price of these cars before they can enter foreign markets, and consequently they are unable to compete with success against foreign cars in their own countries. And yet the point that struck me most this year at the Paris Salon was the Italian invasion. More than a dozen Italian firms took a space, and a very brave show they made. It is unnecessary for me to mention names, but they were there to do business, and some of them were doing business, and have been doing good business in France—regardless of any duty—selling cars to French agents, and to the French and foreign buying public. Belgium was also well represented, and at least two makes of these cars are in great demand in France, and do well, and last, but not least, Germany was exhibiting, and a large number of German cars are sold in France every year, as well as in other countries, including a ready sale in America, where a 45 per cent. tariff is imposed on imported cars.

Speaking of America reminds me that all the leading French firms do excellent business there with their cars in spite of the said 45 per cent. duty.

Therefore, I think I can rightly and truthfully say that it is not the imposition of a duty on British-built cars which prevents their sale into foreign countries, which is responsible for their not being asked for and sought after, and this being so, then what is the matter with British firms and British goods? Is it because they are not advertised? Surely not. With a powerful and responsible Press backing them up, this department cannot be considered as neglected. Is it lack of merit as compared with the leading Continental makes? I dare not assert this or else I shall be accused of belittling the English industry, but at the same time I am curious for an answer. I have read so much lately as to England's position in the world's motor industry that I should like some further information. If anyone can enlighten me, I am sure their information will be of interest to the rest of your readers.

Yours truly,

Dec. 28th. CHAS. JARROTT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have just read a letter in the *Evening Standard* from Mr. Charles Jarrott, the champion of the foreign motor car manufacturer, in which he refers to a speech of mine at Hastings. Possibly the same letter has been received by you, and I therefore forward you my reply. Unfortunately his statements as to what was said at this meeting are incorrect; the position that I put forward was a simple and conclusive one. I pointed out that an order for Napier cars had been received from abroad, which represented something over £30,000 being paid in wages to execute this order, but that while this was satisfactory from the British motor trade point of view at the present moment, I could not look forward to this satisfaction continuing for many years, and that in the relatively near future all these orders which are at present coming to Great Britain for British cars would merely result, as soon as the factory could be worked, in this business being done in British-designed and British-named motor cars, but built in the particular foreign country where the orders are coming from at present. The reason for this was that, whilst at the moment the six-cylinder principle has not been successfully made abroad, the demand for it is here, and the only way for a foreigner to meet it was for him to buy six-cylinder cars from England. The foreign country, however, apparently thinks their workmen of more importance than your correspondent, and, therefore, very properly from their point of view, puts up barriers in the way of tariff charges which make it uncommercial to manufacture the articles in Great Britain and import them to the foreign countries.

I carefully pointed out that this system in vogue in foreign countries of tariff did not injure the British capitalist to such an extent as the British workmen, as it makes very little difference to me whether the Napier cars are manufactured in Great Britain, in America, France, or Italy, but it does make a difference to the British workman who would have been paid wages if all Napier motor cars manufactured in the world were manufactured in Great Britain, and it appears to me from the British working man's point of view, anything that can keep factories in this country, and prevent them going abroad into these tariff protected countries, would be an advantage to the British working man.

Your correspondent, as is usual with those who are really interested in the importation of foreign goods without considering the good of the country, makes general statements, but gives no facts. I have given facts, and I leave these facts to enable your readers to draw their own conclusions. His reference to the fact that, although America has a duty of 45 per cent., that it is still quite easy for countries with great energy to do business there, is simply untrue, and in his efforts to make out that the British manufacturer and the British working man is incompetent and useless, he has endeavoured to prove this by stating that foreigners do import large quantities of motor cars to America. If he will carefully look up the proper records of the country, he will find that 95 per cent. of the motor car business in America is done in American-made cars, and that only a few very rich people buy foreign cars; and there is little doubt but that for the fact of the American tariff, America having started so late in the motor industry, it would have been entirely overrun with motor cars foreign to America, but, owing to their protective tariff, they have been enabled to build up a business, and have to-day at least 95 per cent. of the business done in the country, and the importing business, in proportion to the growth of the motor car business is becoming less and less every year. It seems to me unfortunate that a gentleman whose living depends upon the sale of foreign cars should try to so mislead the public, and one can only assume that it is caused through failure to establish a semi-British car that he is supposed to be interested in. If he will tell us how manufacturers in this country can compete on equal terms with manufacturers of countries who are protected from foreign invasion by a tariff wall, but who are allowed to augment their production by the addition of the British trade, and to trade as freely with Great Britain as a British manufacturer, as it is well known every manufacturer that increases his output enormously decreases the manufacturing expense, and if he can tell us why the factory located, say, in Germany, and supplying goods to a combined one hundred million of people in Germany and Great Britain, as compared with the British manufacturer merely supplying to the British forty millions, is not at an advantage, I should be interested. It seems to me that, in view of the great handicap the British trade has suffered, it is simply marvellous the way that they have steadily rolled back the foreign trade, which only a few years ago had the whole of the business in this country, and now this year the larger proportion is being done by the British manufacturer, who, despite the fact he started making modern motor cars years after his foreign competitor, and has suffered from many restrictive measures and secret attacks written by ostensibly Britons like your correspondent, but whose chief livelihood depends on his faithful service to foreign manufacturers. I ask you, Sir, is such an one likely to have an unbiassed view of the movement that, thanks to the British workman, is steadily pushing out foreign work, with the consequent increase of wages paid to our fellow-countrymen.

Yours truly,
S. F. EDGE.

* * * *

COMMERCIAL POINTS.

Cars for Electioneering Purposes.

MR. E. H. LANCASTER, Managing Director of the Clément Motor Company, 3 Leicester Street, Leicester Square, W.C., announces that he has several Cléments for sale suitable for electioneering purposes, and these can be obtained upon very reasonable terms. Mr. Lancaster will supply the details, on request.

A CHANCE to obtain cars for electioneering purposes is offered by the White Steam Car Company, of King Street, Regent Street, who have received an exceptionally early batch of the new 18-h.p. White Steam Cars, some of which, consequently, they have ready for immediate delivery.

THE Continental Tyre Company desire that all motor car agents whose names were not included in the 1905 edition of their "Handbook for Automobilists in Great Britain and Ireland," should communicate with them at 102–108, Clerkenwell Road, London, E.C., and ask for a form to be filled in with particulars, which will be inserted free of charge. Also any suggestions for improving or making the 1906 edition more complete will be welcomed, and receive every consideration.

THE Straker Steam Vehicle Company, Limited, have changed their name to that of Sidney Straker and Squire, Limited. The business of Straker and Squire has been incorporated under the new title, so that in future everything will be conducted by the new firm. The company requiring larger premises, have left 9, Bush Lane, and are now occupying No. 5, Nelson Square, Blackfriars Road, as temporary offices, pending the completion of new administrative buildings, repair shops, and garage in Nelson Square, so that all communications from this date must be sent to Sidney Straker and Squire, Limited, Nelson Square, Blackfriars Road, London, S.E. Mr. Sidney Straker advises us that, with the exception of the company's works located in Bristol, Sidney Straker and Squire, Limited, is the only firm with which he (Mr. Sidney Straker) is connected.

MESSRS. SHIPPEY BROS., of 13, King Street, Cheapside, inform us that they have purchased the entire stock of the Holden Motor Bicycles from the Motor Traction Company, Ltd., at a large cash discount from stock book prices, which purchace will enable them to sell these machines at about half the original manufactured price.

THE Continental Tyre Company, owing to the increase of their business in Lancashire and Yorkshire, have opened a new wholesale depôt at 255, Deansgate, Manchester. At this depôt a large and well-assorted stock of "Continental" motor tyres, cycle tyres, and cycle rubber goods will be kept, and from where prompt deliveries can be effected when required. Mr. Albert Harness is in charge of this new depôt.

THERE has just been installed at the Panhard-Levassor Repair Works, Kimberley Road, Willesden Lane, an up-to-date plant for the making of wheels, and a large stock of thoroughly-seasoned cleft oak for spokes has been procured. Orders for wheels of any design can now, we learn, be quickly executed. Special shops have been built for re-painting customers' cars, this portion of the work being undertaken during the time the mechanism of the car is being overhauled.

* * * *

CLUBS AND ASSOCIATIONS.

A.C.G.B.I.

ON January 11th, a smoking concert takes place at the Club; in January 18th, Mr. A. G. New, technical editor of THE AUTOMOTOR JOURNAL, will read a paper on "The Tourist Trophy," and amongst others who will give papers on later dates are Colonel Holden, upon the subject of "Ignition"; Mr. Dugald Clerk, "Cylinder Capacity and Horse-power"; and Mr. E. Manville, "Tramways and Motor 'Buses."

Automobile Association.

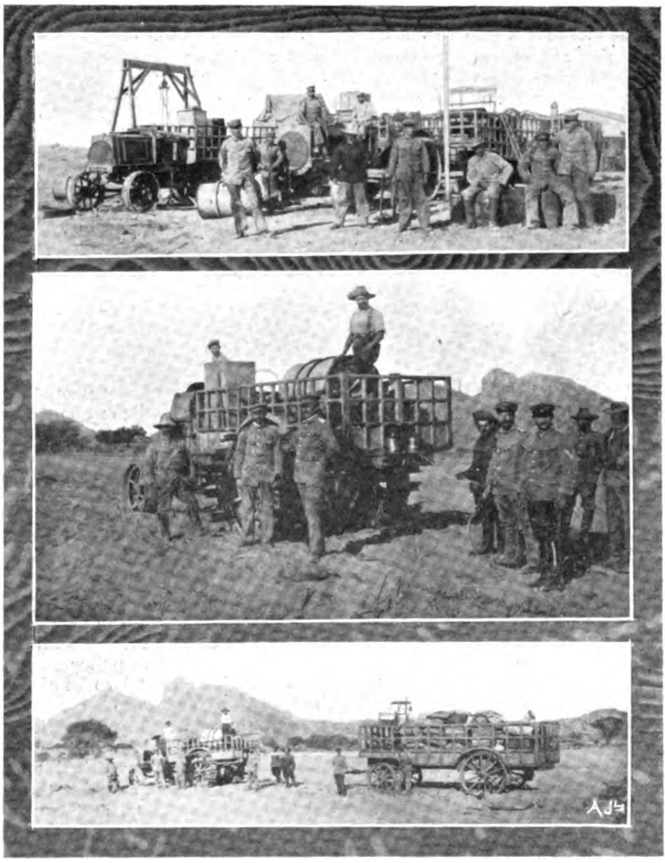
THE first Annual Dinner of the Association will be held at the Trocadero Restaurant on January 25th. A musical entertainment will follow the banquet.

Northamptonshire A.C.

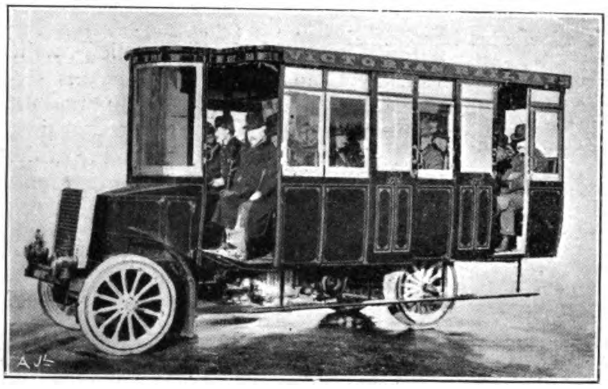
AT a recent meeting of motorists at Northampton, it was decided to form a club under the above title. Mr. C. W. Bartholomew, of Blakeley Hall, presided.

Motor Union Meetings in 1906.

THE monthly meetings of the General Committee during the year are proposed to be held in London except the following:— May (Birmingham), July (Bath), September (York).



The industrial vehicle is being introduced by the Germans into the most out-of-the-way colonies. The three views which we reproduce above, show a couple of "N.A.G." lurries at Swakopmund, in South West Africa, on the journey, being loaded up, and using the winding gear with which they are provided. The rough kind of ground they have to travel over is well shown in the two lower views by the depth to which the wheels of the lurries have sunk into the sand.



MOTOR 'BUSES IN AUSTRALIA.—One of the six steam vehicles which are in operation by the Victorian Railway Department. The chassis have been supplied by Messrs. Clarkson, and are of the standard single-deck type already familiar in this country. The bodies, which are of a peculiar pattern, are being built at Newport in the Government workshops.

MOTOR BOATING.

Motor Boat Meeting in Australia.

Sydney had its first motor boat races on November 13th in connection with the Balmain Regatta. Under the circumstances, a good showing was made of starters in the two events in the programme. The first was a handicap for boats under 25ft. (6 starters), secured by F. P. Cooper's little De Dion, whose time was 12h. 32m. 5s. (1 min. allowance); 2nd, J. Leslie's Nogi, 12h. 33m. 50s. (9½ min.); and 3rd, A. W. Joss's Bullet, 12h. 33m. 50s. (scratch)—a result which commands respect for the handicapper.

In the second handicap event for boats over 25ft. (8 starters) the first three were: 1, C. A. Marshall's Togo, 1h. 43m. 20s. (25 min.); 2, Dr. G. Read's Asthore, 1h. 43m. 45s. (20½ min.); 3, J. E. Clumery's Bona, 1h. 45m. 40s. (13 min.)—another triumph for the handicapper.

Coupe du Salon.

Like most of the motor boat meetings of 1905, the last of the year—held on Sunday last on the Seine above Paris—fared no better than its predecessors. So far as racing craft were concerned, Antoinette III was the solitary starter, and even this speedy boat had to retire after covering one lap, through a frozen carburettor. For the rest, Forcès-Pas, the Mors-engined cruiser, was timed for the three laps, equal to a total distance of 28·05 kiloms., in 56m. 57s., no other contestant coming within 25 mins. of her time.

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MOTOR CYCLING.

The results of Class D for motor cycles, in the Melbourne-Sydney reliability contest, are given elsewhere in the present issue, in connection with the general account of the run.

Motor Roads—for Motors or Promoters?

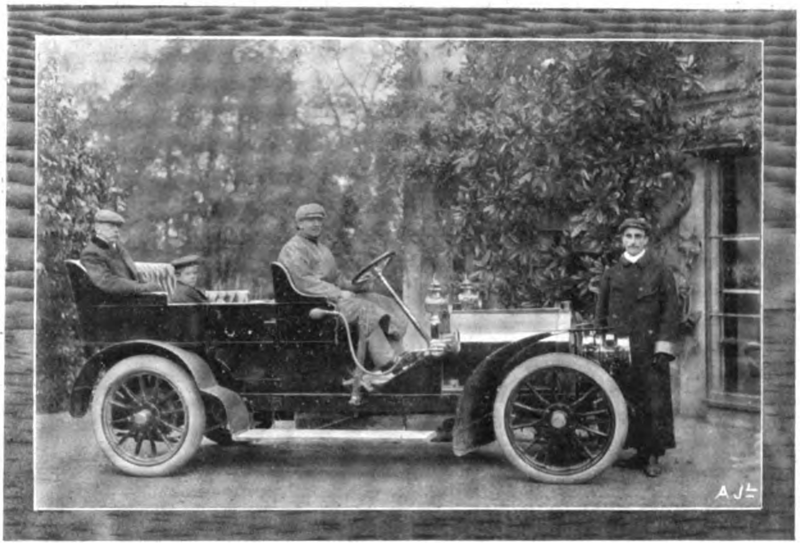
What we knew and prophesied would happen has already taken place. The financial gentlemen who are *determined* to promote (and if possible pass) a bill for making a motor road to Brighton, have evoked from an anti-motoring clergyman, to wit, the Rev. J. P. Bacon-Phillips, who writes from Crowhurst Rectory, Sussex, observations redolent of anti-automobilistic *odium theologicum*. He has written to the *Standard* the following letter:—

> "I regret to see that considerable opposition is manifesting itself against the proposal to construct a motor road from London to Brighton. I have recently been staying at Redhill, and the enormous number of motor cars on the main Brighton road I calculate exceeds every other kind of vehicle by at least six to one.
>
> "I am aware that Brighton has been abnormally full this Christmas, but the fact remains that if the number of cars increase by the same ratio as they have done during the last twelve months, this famous road will become absolutely impassable for every other kind of vehicle. The best solution to this difficult problem is the new motor road, and as this proposal emanates from the motorists themselves, it seems to me to be very short-sighted policy to offer any opposition to it. Our highways were not constructed for motor traffic, and, therefore, separate motor roads appear to me a step in the right direction."

A better illustration of the arguments which we have always advanced against a separate motor road could scarcely be asked for. The reverend anti-automobilist embraces, it will be seen, with effusion the opportunity offered of getting motorists off the ordinary roads, and he adds—we think without justification—that the proposal emanates from motorists themselves. If he had added the little particle "pro" and cut off the "ists," his statements would be more in accordance with facts. The whole proposal, indeed, suggests most forcibly that it is designed in the interests of the promoter first and of the motor second.

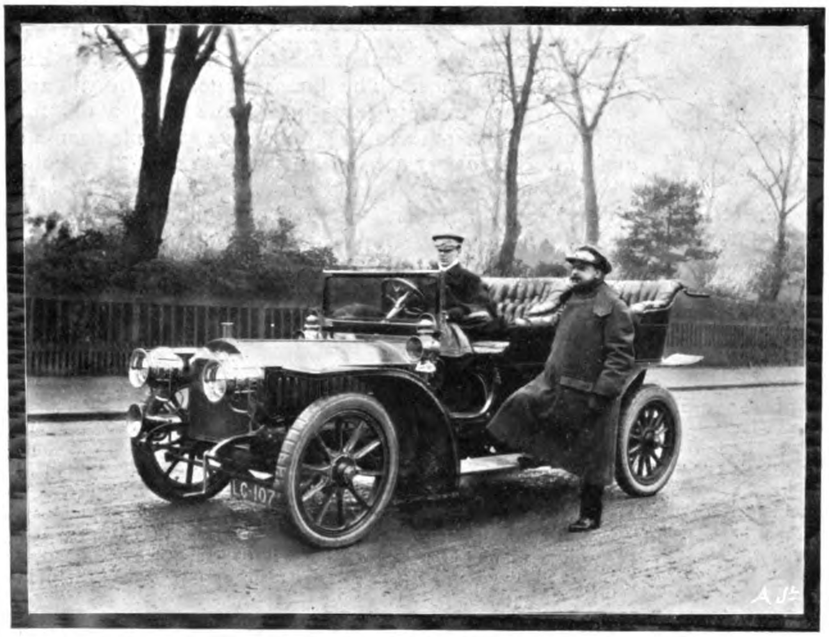
Motor 'Bus Service Resumed.

The motor omnibus services of the Great Eastern Railway, in different parts of Essex and Suffolk, which were temporarily discontinued, are, it is announced, to be resumed at an early date.



Copyright.

"Three Generations and a Car," is the title which Mr. C. B. Fry, the popular cricketer, has given to the above picture, the explanation being that Mr. Fry is himself at the wheel of this 16-h.p. De Dietrich, in the back are seated Mr. J. L. Fry, his father, and Mr. Steven Fry, his son.



Mr. William Le Queux, the well-known novelist, in his 40-h.p. Napier car, in which he is making a 5,000 miles tour in England and Wales.

Another Testimonial for Municipal Trading.

A RATHER comic state of affairs, and one which provides another of the many satires on municipal trading that the attempts of civic bodies to engage in commerce have provided us with, prevails at the present moment at Birkenhead and Liverpool. The traffic between Liverpool and the suburb on the other side of the Mersey has, till recent times, been carried on mainly, if not exclusively, by the steam ferry-boat service which is run by the Birkenhead Corporation. Many people who have suffered from this service will remember it well, and they will recollect that recently one of the ferry-boats tipped the motor car of Mr. Cinquevalli into the Mersey. The monopoly which the municipal ferry-boats once enjoyed, however, is now seriously threatened by the Mersey Tunnel Railway, which is much quicker and more expeditious. The Corporation are countering by running the electric trams, which they, of course, own, so as to feed the ferry-boats, but so as to expose intending passengers by the Tunnel Railway to the maximum of inconvenience. Thereupon the Railway Company started a service of motor 'buses to feed their railways, and enable Liverpudlians to arrive in Birkenhead without having to expose themselves to the drawbacks of the ferry-boat service. Will it be believed that the Corporation are applying for an injunction to prevent the Railway Company from running these motor 'buses to bring people to their termini? Here we have a Corporation absolutely interfering with the convenience of its own ratepayers as a consequence of its being permitted to engage in trade. A worse or more damaging commentary on municipal trading it would be difficult to find. Whether the Corporation succeeds in obtaining its injunction or not, however, need, it seems to us, trouble the Railway Company but little. All that the company need do is to register another company with the customary seven signatories, and with funds supplied by the Railway Company to run the 'bus service. In that case it will be unimportant whether an injunction is granted against the Railway Company or not. Probably, if this course is adopted, it will be found that the litigation will not go very far, and we shall not be likely to hear much more of that terrible word "injunction."

New Royal Cars.

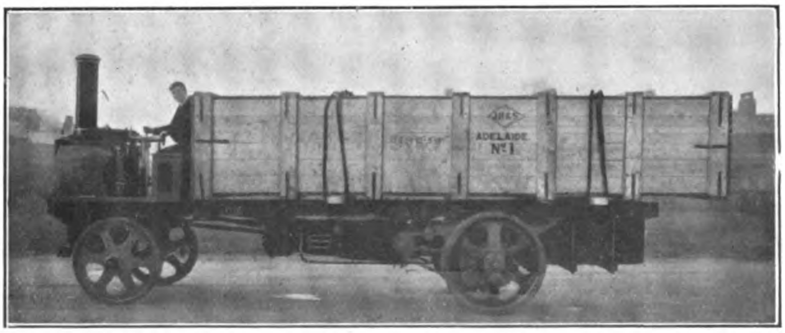
THE 35–45-h.p. motor carriage built by the Daimler Motor Company to the special order of the King, was delivered by the Company to His Majesty at Sandringham on Christmas Day. Her Royal Highness Princess Henry of Battenburg has also ordered a car from the Company of 30–40-h.p.

Electioneering and Motors.

THE North London Automobile Club, through their hon. secretary, Mr. Charles Smith, of Avondale, Brownlow Road, New Southgate, N., will be pleased to hear from motorists in the North London district who are willing to lend their cars to assist Colonel Bowles (president of the club) for the General Election. Colonel Bowles is in accord with the abolition of the speed-limit, and is prepared to support a measure requiring the universal lighting of all vehicles after dark.

An Eccentric Jump-Spark.

E. J. Pennington, under the name of the Continental Engineering Company, has bobbed up once more in the United States. This time it is a wonderful sparking-plug which, as usual, is to revolutionise the motor industry. From the only description at present to hand the idea seems as egregious as the famous "mingling" spark theory expounded by Pennington many years ago. We learn from the *Grand Rapids Press* that the plug has a combustion chamber of its own, from which it flashes forth flame in order to ignite the mixture in the cylinders. The spark itself, we learn from the same source, "jumps about eccentrically." No wonder!



A USEFUL TEST LOAD.—One of the Lancashire Steam Wagons starting on a trial run, loaded with a crate containing the Chassis of a Leyland Petrol Omnibus, for shipment to South Australia.

The Kaiser's Chauffeur.

Werner, the well-known Continental racing chauffeur, has, since the death of Mr. Gray Dinsmore, whom he used to drive, been selected by Kaiser Wilhelm as his driver.

To Advise the Police.

The Secretary of State has appointed Mr. W. Worby Beaumont, M.I.M.E., to act as adviser to the Commissioner of Metropolitan Police in matters relating to motor cars and omnibuses.

Motor Lifeboats.

Under the will of Mr. Frederick Kitchen, of Drws-y-Coed, Trefriw, Carnarvon, the National Lifeboat Institution receives over £6,000 for "the purchase of a motor lifeboat, to be placed on the West Coast of England."

Salon Lottery Prize.

Mdlle. Bocaudé, a daughter of one of the directors of the Gillet-Forest Company, is the lucky winner of the first prize, an 8-h.p. De Dion car, in the Paris Salon lottery.

Scavenging Authorities Take Note.

In a recent case, in which a motorist was summoned before the stipendiary magistrate at Westminster for having the number of his car obscured, it was proved that it was merely covered with mud owing to the state of the streets. Under these circumstances the magistrate refused to convict.

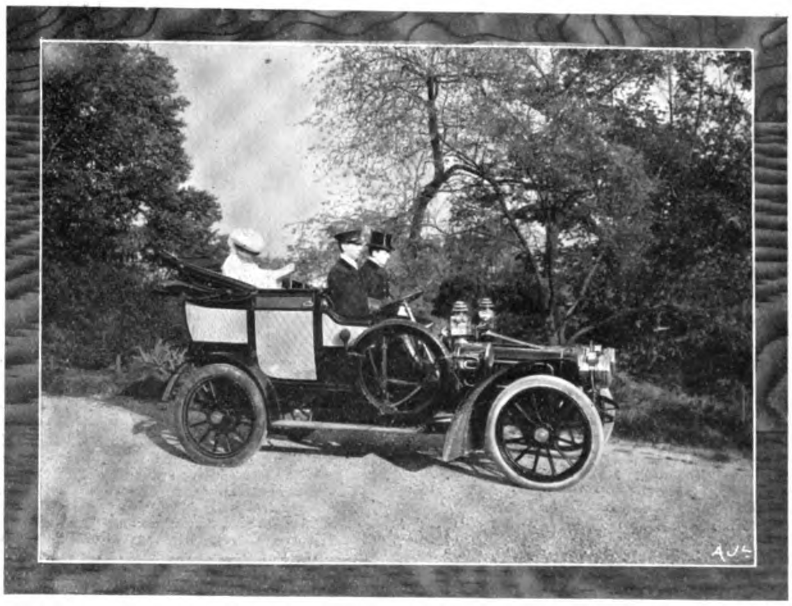
Dangerous Tramway Brakes.

As a shocking example of the dangers the public, in some districts, run from the high speed and imperfect brakes of electric tramcars, we draw attention to the fact that the Executive Council of the Amalgamated Association of Tramway and Vehicle Workers recently passed a resolution as follows:—

> "That there is urgent need in the interests both of the travelling public and the tramway employés that the Board of Trade should compel the various tramway undertakings to adopt a standard type of brake for all tramways, which shall be simple in construction and independent of wires and complicated mechanism."

Driving Licences and their Renewal.

Among the absurdities of the 1903 Act, attention has been drawn to the situation which arises in reference to the renewal of a licence which the driver, according to the police, must carry with him on all occasions when he drives his car. Licences have to be renewed, and if you send them for renewal you cannot in consequence safely venture to drive your car till you get them back again. A licence-holder recently wrote to the County Council pointing this out and asking them if they could provide him with any form to show that the licence was in their possession for the purpose of renewal. He received the reply from the official that all he could suggest was that the licence should be forwarded for renewal on some day on which the holder did not wish to go motoring, and that it would be returned to him the same day. As a matter of fact, it is very unusual for a licence to be renewed the same day that the application is made, and it seems a preposterous oversight of the legislature (though just the sort of thing that one might have expected), for car owners, numbers of whom use them for business purposes, to be in this way deprived of the use of their cars for one or more days in the year at the discretion of the local authorities.



Mrs. Leslie Carter, the well-known American actress, in her park landaulette.

Glidden Tour.

Mr. Charles J. Glidden, when last heard from, had run his total mileage, travelled round and about the world, up to 27,574 miles. He is now on his second tour of the world, having driven 2,474 miles to a north-westerly point in India since he left Bombay, and traversed the famous Kyber Pass into Afghanistan.

New Badges for Public Service Drivers.

In a few days London cab and 'bus drivers will have to wear the new registration badge on their arms. Each type has had a distinctive colour allotted, that selected for motor cabs being green with white figures, and for motor omnibuses blue with white figures. *All* conductors will have red badges with white figures.

Driving and Mechanical Proficiency Certificates.

The next examination for these Automobile Club certificates will be held at 119, Piccadilly, on January 17th, at 10 a.m. Candidates can take either or both examinations. Particulars can be obtained from the club secretary.

Racing a Hare.

Most motorists have observed, when driving at night time in the country, the curious manner in which rabbits seem to be attracted by the head-lights and speed of the car, often with very disastrous results to themselves. In regard to this the Wolseley motor Company write us, enclosing a photograph of a very fine hare, which tried conclusions with one of the new 32-h.p. Siddeley cars along a deserted stretch of road between Birmingham and London. The occupants of the car were surprised to see a big animal racing in front of them. It maintained a very high rate of speed for a minute or two, then suddenly collapsed and fell, the inference being that it had overstrained itself, for no part of the car had touched it. The hare was quite dead, and without any apparent mark of injury on it.

NEW COMPANIES REGISTERED.

Automobile Contract Company (Limited), 5, Augustus Street, Albany Street, N.W.—Capital, £1,000 in £1 shares. Object, to carry on the business of vendors of motor carriages of all kinds on the hire-purchase system, &c. First directors: Sir Samuel Scott, M.P., C. H. Burnard, and S. Lee.

W. Bath and Son (Limited), 25, Victoria Street, Westminster.—Capital, £50,000 in £1 shares (25,000 cumulative preference). Object, to carry on the business of manufacturers and dealers in engines, motors, and carriages propelled by mechanical power. First directors: H. W. Sale, W. B. Bath, and W. Savage.

Chapman Von Sobbe and Co. (Limited).—Capital, £5,000 in £1 shares. Object, to take over the business of motor car agents carried on at Liverpool as Chapman Von Sobbe and Co. F. C. Bowring, E. N. Thornewill, C. N. Watson, G. Chapman, and F. A. Von Sobbe.

Hammon and Smith (Limited), Dale Street, Coventry.—Capital £2,000 in £1 shares. Object, to carry on the business of engineers, makers, and repairers of motors, motor cycles, &c. First directors: W. G. Hammon, H. N. Smith, W. G. Hammon, jun., J. Hale, T. A. Gardiner, A. W. Thompson, and J. T. Fazakarley.

Hertfordshire County Automobile Club (Limited).—Registered with twenty members, each liable for 2*s*. 6*d*. in the event of winding up.

Light Motors (Limited). — Capital, £2,000 in £1 shares. Object, to carry on the business of manufacturers and repairers of motor-propelled cycles, &c.

Portsmouth and Southsea Engineering and Motor Car Company (Limited), 29, Landport Terrace, Southsea, Hants.—Capital, £1,000 in £1 shares. Object, to acquire lands, and buildings at Landport Terrace, Southsea, and to carry on the business of engineers, motor car manufacturers, &c. First directors: E. H. Boulton, T. Mattinson, and A. Talker.

Resistant Pneumatics (Limited). — Capital, £12,000 in £1 shares. Object, to adopt an agreement with the Richardson and Price Engineering Company, Limited, and to carry on the business of manufacturers of pneumatic and other tyres.

J. Schofield and Sons (Limited).—Capital, £1,000 in £1 shares. Object, to acquire the business carried on by H. Schofield, as J. Schofield and Sons, at Heybrook, Rochdale, dealers in motors, carriages, &c.

⁂

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

4098. 27th February, 1905 Improvements in Change-Speed Gear. John Johnston, 3, Ruvigny Mansions, Putney, S.W., and Harry W. Buddicom, Penbedw, Nannerch, near Mold, Flint, North Wales. This invention relates to change-speed gear for use upon motor-driven vehicles of the type wherein the power from the motor shaft is transmitted to the driven shaft through sets of sun and planet gear of different values, some of the sun-wheels of which are adapted to be respectively retarded to give changes in speed or direction. There are three figures. Fig. 1 is a longitudinal section of a gear according to this invention. A small sun-bevel wheel, *a*, is keyed or pinned to the driving shaft, *b*. A second sun-bevel wheel or pinion, *c*. of equal diameter, but with teeth oppositely arranged in relation to the first, *a*, is loosely mounted on the same shaft, *b*. These two sun-wheels, *a* and *c*, are hereinafter referred to as the fixed and loose sun pinions respectively. Upon the outer end of the extended boss or sleeve, *d*, of the loose sun pinion, *c*, is rigidly mounted, one element, *e*, of an expanding or other clutch, forming also a brake drum, referred to as the second speed drum, acting as a brake drum on its outer periphery, and a clutch surface on its inner periphery, adapted to be engaged by a clutch member, *f*, on the driving shaft, *b*. Loosely mounted on the same boss, *d*, is a sun-wheel, *g*, also having a brake drum, *h*, rigidly mounted on its extended boss, referred to as the third speed drum. A sun-wheel, *i*, of equal diameter to the one, *g*, just referred to, but with oppositely arranged teeth, is loosely mounted at the opposite side of the gear, and has the reverse brake drum, *k*, keyed on its boss. The latter sun-wheel, *i*, runs loosely on a sleeve, *l*, which is keyed to the driven shaft, *m*, and is loose on the driving shaft, *b*. From this sleeve, *l*, a number of radiating arms, *n*, extend, having a circumferential flange to which the bosses, *o*, are attached by screws, the bosses embracing the ends of radial pins, *r*, on which latter double planet pinions, *p q*, are mounted. The planet pinions engage the sun-wheels and pinions, and the radial arms or concave disc, *n*, form a driving member for transmitting the torque from the planet pinions to the driven shaft. The planet pinions are double or in pairs. Each has a pinion, *p*, meshing between the sun pinions, *c* and *a*. The planet pinions are, as before stated, supported on radial pins, *r*, carried by or extending from a boss, *s*, loosely mounted on the boss, *t*, of the fixed sun-pinion, *a*, the planet pinions running loosely on the pins. The whole of the gearing is encased by an oil-tight casing, *u*, so that it runs continuously in an oil bath.—December 13th, 1905.

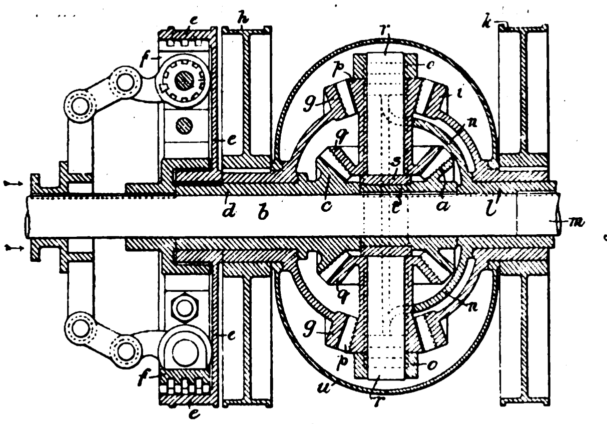
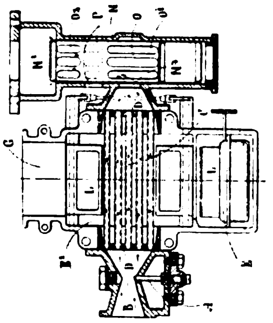


Fig. 1.

6919. 1st April, 1905. Improvements in Carburettors particularly for Fluid-Pressure Engines. Edmund W. Lewis, 2, Albany Road, Coventry. This is a peculiar title, as a "fluid pressure" engine is usually taken to indicate a steam engine, and the title should apparently have been, "Improvements in Vaporisers for Internal Combustion Engines." A small quantity of air is drawn past the jet in the usual way, so as to pick up the required amount of fuel. This charge is then passed through a vaporiser, after which additional cold air is added. The chief advantages of this arrangement are that only a small quantity of cold air is admitted to the vaporiser, and, therefore, the amount of heat necessary to keep it at the proper temperature is small, and that the temperature of the complete charge going to the engine is low in that a small amount only passes through the vaporiser. It is preferred to heat the vaporiser at starting with a lamp which is automatically extinguished when the engine has started up, after which the heating is effected by the exhaust gases. There are three figures. Fig. 1 is a central vertical section of this vaporiser. It comprises a fuel nozzle, A, and a constricted air passage, B, adjacent thereto, constructed so that a small quantity of air will take up a relatively large quantity of fuel from the nozzle, A, under the action of the engine suction in the ordinary manner. The spray-chamber, B, of this carburetting device is suitably attached to the vaporiser. A set of tubes is fixed into end plates, D. Beneath the tubes C. is arranged a heating lamp, E, which may be fed with the same fuel by means of a constant level float device. The hot gases from this lamp pass around the vaporiser tubes, C, which resemble those of a fire or water tube boiler, and pass out through a chimney or outlet, G, at the top of the vaporiser chamber. The vaporiser chamber is divided into two parts vertically, so that the vaporiser tubes, C, and their end plates, D, may be withdrawn for cleaning purposes. Adjacent to this heating chamber, E¹, is an exhaust passage forming part of the exhaust system of the engine. Passages are made in the wall dividing the exhaust passage from the heating chamber, E¹, at the top and bottom thereof, in such a manner that a by-pass is formed from the exhaust passage through the heating chamber, E¹. Preferably these passages are covered by hinged flaps, L, adapted in one position to close the passages and in the other position to close in the one case the orifice, E², over the heating lamp, E, and in the other case the outlet, E³, from the top of the heating chamber, E¹. The object of these flaps is to extinguish the heating lamp as soon as the engine has started up. These flaps are connected together so as to operate simultaneously. The vaporiser tubes, C, communicate with a mixing chamber, N, arranged at right angles to the vaporiser tubes. There are two sets of holes in the perforated piston, O, which is closed at both ends. These holes are elongated, and one set is adjacent to the inlet, N², to the mixing chamber, N. In the wall of the mixing chamber, N, and above the normal position of this first set are extra air intakes, P, adapted to communicate with the elongated holes, O¹, when the piston rises. The second set of holes, O² are arranged at the end of the piston, and are normally covered, but when the piston rises, these holes, O², are partly uncovered.—December 13th, 1905.



Patent Specifications Published.

Applied for in 1904.

Published January 4th, 1906.

24,326. A. J. B. Légé. Intl. combn. engines.
24,348. N. W. H. Sharpe Silencers.
26,968. R. W. Wilson and F. G. D. Johnston. Variable speed gear.
27,123. T. G. Wright. Four-stroke cycle explosion engines
28,477. L. E. Cowey. Speed indicator.
28,520. R. O. Harper. Intl. combn. engines.

Applied for in 1905.

Published January 4th, 1906.

396. W. I. Twombly. Multiple coil flash boilers.
1,314. P. Richardson and Brotherhood-Crocker Motors, Ltd. Motor Road vehicles.
1,929. G. Barker. Motor cars.
2,943. Metallic Mirrors (of America), Ltd., and I. E. Lewis. Lamps.
4,517. W. G. Hay. Steam generators.
6,424. S. E. Alley and D. H. Simpson. Differential gear.
17,559. F. Remnant. Motor tricars.
1,775A. J. Hummel. Clutch mechanism.
17,785. Soc. Peugeot. Carburettors.
18,046. A. Louis. Vaporisers.
18,047. A. Louis. Vaporisers.

The Automotor Journal, January 13th, 1906.

The AUTOMOTOR JOURNAL

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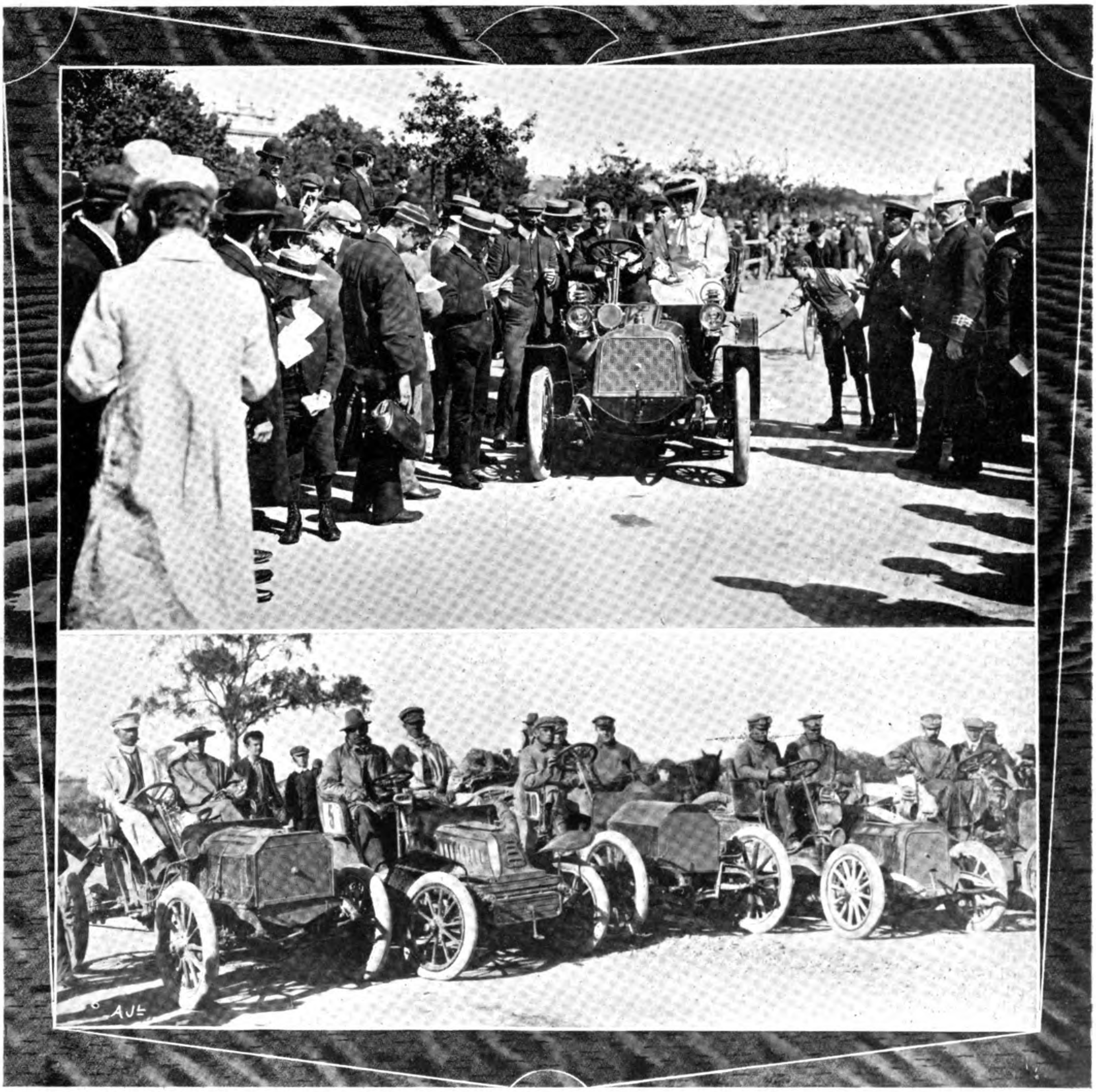

MELBOURNE-SYDNEY RELIABILITY TRIALS.—The Haymarket, Melbourne, the starting point for the Dunlop Reliability Contest. In our top picture Mr. and Mrs. Cox are seen on their 8–9-h.p. Talbot Car. Mrs. Cox was the only lady who took part in the Trial. In the lower picture the five contestants who, after driving 1,276 miles, ultimately tied for the Dunlop Cup, are seen on their respective cars. They are, reading from left to right: (1) H. Tarrant, on his 8–10-h.p. Tarrant Car; (2) S. H. Day, 8-h.p. De Dion; (3) G. Hobbs, 12–24-h.p. Mercedes; (4) W. B. Wilkinson, 10–12-h.p. Talbot; (5) W. R. Grimwade, 10-h.p. Argyll. A full account of this reliability test appeared in our last issue.

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DIARY OF FORTHCOMING EVENTS.

British Events.

Jan. 15 ...	"Indicated and Horse Power of Motors," by Prof. Archibald Barr, D.Sc. (Scottish A.C.).
Jan. 15–20 ...	Brighton Automobile Exhibition.
Jan. 17 ...	Auto-Cycle Club Dinner.
Jan. 19–27 ...	Birmingham Motor Show.
Jan. 20 ...	Auto-Cycle Club Quarterly Trial.
Jan. 26–Feb. 3	Crystal Palace Motor Show.
Jan. 26–Feb. 3	Edinburgh Show.
Jan. 27 ...	Tri-Car Hill-Climb, Lewisham A.C.
Feb. 15 ...	*4,000 Miles Tyre Trials.
Feb. 15 ...	*Lamp Trials.
Feb. 9–17 ...	Liverpool Motor Show.
Feb. 9–17 ...	Newcastle Motor Show.
Feb. 10 ...	Tri-car Hill-Climb, River Hill (Lewisham A.C.).
Feb. 19 ...	Scottish A.C. (Western) Annual Dinner.
Feb. 23–Mar. 3	Manchester Motor Show.
March 9–17...	Glasgow Motor Car Show.
March 24–31	Cordingley and Co.'s Motor Show.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
Aug. ...	*Van Trials.

Foreign Events (Trials, Races, &c.).

Jan. 13–20 ...	Brussels Exhibition.
Jan. 13–20 ...	American A.C. Show, New York.
Jan. 17–20 ...	Western Indian Trials.
Jan. 22–27 ...	Ormond-Daytona Beach Races.
Jan. 26–30 ...	Calcutta Motor Trials.
Feb. 3–18 ...	Berlin Motor Show.
Feb. 3–18 ...	Turin Automobile Show.
Feb. 5–11 ...	Paris Voiturettes and Tri-car Trial (*Les Sports*).
March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
April 1–17 ...	Budapest Exhibition (A.C. of Hungary).
April–May ...	Milan Exhibition.
April ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 13–14 ...	Tour de France (Motor Cycles and Voiturettes).
June 10–16 ...	Herkomer Cup.
June 28–29 ...	Kiel Motor Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15–16...	Mont Ventoux Hill-Climb.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

The Approaching Election. A proclamation has been issued by a number of charming Peeresses to motor car owners supplicating them to supply cars during the forthcoming struggle on behalf of Unionist candidates in London. It is not suggested by the ladies in question that any pledge should be asked for, much less exacted, from the candidates as to whether they will support the automobilist movement on the lines on which we have frequently insisted, and to which the Automobile Club and the Motor Union require subscriptions. We embrace the occasion, therefore, once more to enforce the principle that automobilists should make a rule, quite irrespective of political parties, of only supplying the asked-for assistance in cases in which the prospective candidates are willing to subscribe to the articles of faith to which we have already referred editorially, and which appeared in our advertisement pages last week. It is superfluous to urge once more that for the vast majority of motor car owners automobilism is, or should be, of paramount interest, and that however much any individual car owner may be feeling inclined to accede to the appeal of the ladies to whom we refer, he will be acting in a decidedly short-sighted manner unless he is reasonably assured that the candidate whom he is helping is willing to assist the automobile movement. We have already explained that the Club and Motor Union Joint Committee has arranged to organise all offers of cars which may be placed at its disposal in such a way as to afford support only to candidates who are willing to pledge themselves to measures which all automobilists desire to see passed. In spite, therefore, of all seductions which may be brought to bear upon them, car owners who are willing to lend their cars for electioneering purposes will be adopting the wise course if they confine their action to putting themselves into communication with the secretary of the Joint Committee, and allow their arrangements to be guided entirely by him. The importance of the coming election as regards the future of the automobile movement is very accurately gauged by our enemies, and the Chairman of the Highways Protection League has also issued a proclamation proposing that wherever possible statements should be obtained from candidates which will pledge them to an anti-automobile attitude. Needless to say, candidates who give the kind of answers required by the Highways Protection League will *not* be supported by the automobile forces, or by the phalanx of cars which the Joint Committee has at its disposal. Everyone, therefore, who places a car at the Committee's disposal, will know, at any rate, that it is safe from the clutches of the Highways Protection League.

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The Views of Magistrates on the Situation. "Arising out of that," as the framers of supplementary questions in the House of Commons are fond of saying, it is of interest to draw the attention of everyone, and particularly of all Parliamentary candidates who may be hesitating in regard to subscribing the articles of faith required of them by the club and the Motor Union, that as regards the arbitrary speed limit enforced by the existing Act, a very large number of magistrates who have had practical experience of its working are in favour of the repeal of that restriction. No less than 173 magistrates of the United Kingdom, including representatives of the Benches of nearly every county in the Kingdom, have put their names to a statement expressing "their strong sense of dissatisfaction with regard to the operation of the clauses in the Act of 1903 which regulate the speed of motor cars," and consider "that the first clause of the said Act (about reckless driving) is amply sufficient for the purpose." Considering that such a phalanx of magistrates, who have had at first hand opportunities of judging of the working of the 20 mile limit clause, takes this pronounced view, Parliamentary candidates who may be doubtful on the question should feel little hesitation in deciding as these magistrates have done. The support that they will get by doing so is worth having, for, as we have pointed out, the most powerful support that any candidate can obtain at the polls is that of an adequate squadron of motor cars, and he will be provided with such a phalanx if he subscribes to the articles of faith which have been drawn up. In that case both the Automobile Club and the Union will do their utmost to see that he gets adequate car support, and the utmost that these two great bodies together can effect is considerable!

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Unconsidered Military Aspects of Automobilism. It has hitherto always been necessary, in order to provide adequately for the defence of the country, to adopt means by which an extra supply of draught horses can be obtained, in good and reliable condition for army use at short notice, immediately on the outbreak of war. Of course it will be understood that horses employed for military purposes fall into two great classes. There is the trained military horse, the quadruped that forms the unit of a squadron of cavalry, or has been trained (in the artillery) to bring guns into action, and to tolerate, if not to enjoy, the discharge of them at sham fights and manœuvres, and that type of horse may be regarded as a permanent member of the staff. You cannot take a horse from the shafts of a London 'bus or a London cab and expect him to perform this kind of duty with satisfaction to his employers. There is also, however, the equally large, if not larger, class of horses employed in transport and commissariat duty. An army, as Napoleon said, marches on its stomach, and unless the commissariat department is in good working order, and that has hitherto practically meant being well horsed, the mobility and efficiency of an army in the field will be sadly circumscribed.

The way in which the War Office—the same practice has also been adopted by foreign states—has met the necessity of supplying an immense number of extra horses for commissariat and transport work in time of war, has been to subventionise the great horse employing companies, primarily the 'bus companies, secondarily the railway companies, thirdly the cab organisations, and after them private firms like brewers and contractors. In return for certain payments these firms register the horses that they will be able to place at the Government's disposal when required to do so. Hitherto the system has worked fairly well. At any rate the number of 'bus horses who disappeared from London during the South African War, and left their bones to whiten on the veldt, was very considerable.

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An Altered Problem. But now the conditions are rapidly changing. That most remarkable phenomenon of London locomotion, the successful advent of the motor 'bus, and the less conspicuous, though hardly less successful, advent of the motor lurry for railway, brewery, and heavy transport work generally, is already beginning to make itself felt, and it is understood that the War Office is even now beginning to experience increased difficulty in finding the number of horses it requires for registration in accordance with the arrangement which we have referred to. In a year's time this difficulty will be greatly accentuated, and it does not require the eye of a prophet to foresee that in a very limited period the 'bus, tram and heavy traction horse generally will be as extinct as the rhamphorhynchus. Even before that day dawns, probably even our War Office will have recognised that whether horses continue to be necessary or not for cavalry and field artillery, the day of their successful employment for military transport will have long passed away. Various military authorities, as we have reported, have from time to time drawn attention to the imminence of this problem, and a very sensible proposal has now been made by "an officer"—whose identity we do not think it would be difficult to fathom—that instead of the registration of horses, and the subventionisation of their owners, the War Office should in future arrange with the 'bus companies to adopt 'bus chassis of a uniform type, with removable or detachable bodies. Instead of registering horses, the course would then be to register a chassis, and when the War Office required them they would call upon the 'bus company to remove their 'bus bodies and send the chassis on to the War Office, who would then provide them with the lurry or other body which they required for use in the field. The adoption of this proposal would mean that the War Office would be able to provide itself with a magnificent reserve of transport power—more reliable and accessible than ever before, while the money paid in subventionising the companies would benefit a new industry to a marked degree and assist in the general adoption of the self-propelled 'bus and transport vehicle. The proposal is a thoroughly practical and well-considered one, and with a new broom at the War Office, it is, perhaps, not too much to hope that we may ultimately see it adopted.

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Imports and Exports. On another page we furnish statistics concerning imports and exports—carefully compiled by THE AUTOMOTOR JOURNAL from official sources — which embody practically all the reliable information that is available on the subject. Previous to the year 1900, when, of course, neither automobile exports nor imports were deemed to be of sufficient importance, no special trade returns were available—motor cars, motor cycles, parts and accessories being all included in the grandly comprehensive but hopelessly unenlightening title of "goods, unenumerated, manufactured." During 1900 and 1901 they were included under the general heading of "carriages, wagonettes, carts, &c.," so that the returns were still of very limited usefulness, and even in 1902 and 1903, when cars and motor cycles were placed under a heading of their own, they were lumped together. Only for 1904 and 1905 have they been properly placed under separate and adequately descriptive headings. It is only the figures for the last two years therefore, that, have any real significance, interesting in a way as are those given previously, but these recent figures, as will be seen when examined in detail, prove enormously instructive. In 1904 the value of cars imported to the United Kingdom was just over two millions sterling. In 1905 the same imports rose to £2,438,000, showing an increase of nearly half a million, whilst "parts" amount in all to nearly a million. Lumping the total value of the imports of cars, motor cycles, parts, and accessories, brought into the United Kingdom altogether, the figures for last year amount in all to a value of £3,446,966 as against approximately £2,472,000 in 1904, so that automobile imports taken altogether have increased by an amount represented in pounds sterling by nearly a million.

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And their Significance. As representing the relative advantages to the foreign car builder, however, these figures require some correction, for the large item of upwards of £900,000 for motor car parts represents, no doubt, engines, gear-boxes, axles, springs, and other items which are put together in this country to form complete cars. The main lesson of the statistics, however, is that the imports into Great Britain of finished cars still continue to increase, and to increase more rapidly than formerly. In fact, out of the thirty-four leading lines of manufactured goods specified by the Board of Trade returns, *motor car imports come ninth in actual value*, while among those that represent larger sums only a few exceed the motor car figures by anything like large amounts.

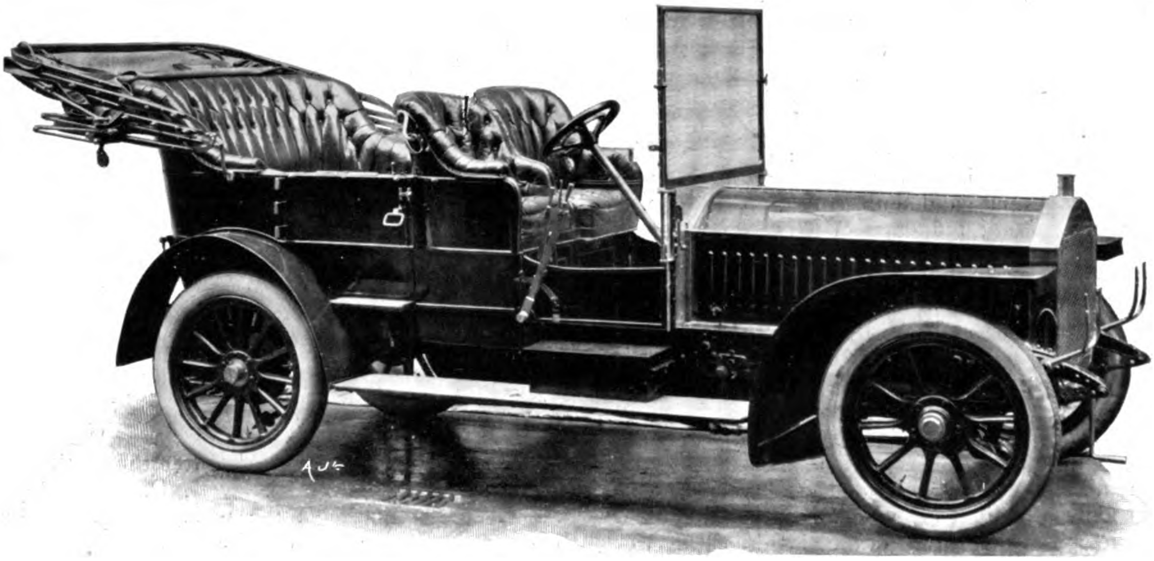
Now we know from the statistics of exhibitions and from various other more or less reliable sources, that the number of cars bought in this country represents a far greater increase than the 25 per cent. shown by the importation figures. It therefore follows that the output of British car builders must have gone up by leaps and bounds during the past year, and that the British industry is now obtaining a far larger share of home business. Even were this not the case, however, the mere fact that foreign imports of finished cars still continue to increase is a very satisfactory sign in itself, for it at least indicates the manner in which the cars sold in 1904 have led to the sale of even more during last year. This is a decidedly healthy state of affairs, and will no doubt continue more and more markedly for some considerable time to come. We commend the figures which we publish, therefore, to the careful consideration of the new Parliament, so that when certain few rabid cranks make their customary attempts to cripple the growing industry by ill-advised and narrow-minded legislative restrictions, their ravings may receive a suitable cold douche of statistics.

"In Splendour Bright."

THE Surrey Joint Committee has authorised the expenditure of £52 7*s.* to provide the Chief Constable, Capt. Sant, with a new and, considering the price, presumably resplendent uniform—at the expense of the county. This is the sort of recklessness that results from raking in too many fines from motorists, in accomplishing which Capt. Sant has been singularly successful. Before the days of motor car fines, it was probably not customary to deck out chief constables with such gorgeousness as to cost £52 7*s.* a time. Motorists who have doubtless provided the greater part of the £52 7*s.* will probably be anxious to see what sort of appearance he presents when thus embellished. He ought at least to be placed on exhibition in his new disguise on Saturdays and Sundays on the Ripley Road. If horses (and donkeys) take fright at the portent, the Anti-automobilist (and donkey-loving) Joint Committee will only have their own extravagance to blame.

THE 1906 SIX-CYLINDER NAPIER CARS.—PART I.

ON November 18th last, THE AUTOMOTOR JOURNAL contained illustrated descriptions of a large number of those new cars which are being turned out at the present time by well-known firms, and amongst these was included—on pages 1412 and 1413—an article dealing in a general manner with the latest Napier models. Attention was then drawn more especially to the remarkable equipment of the Napier factory, to the extraordinary extent to which cost of production is rendered subservient to nicety and refinement of finish and design, and to the great demand that has been created by this most progressive firm for their 6-cylinder cars. A few words were moreover devoted to the special advantages resulting from the use of six cylinders, and it was not only pointed out that even greater flexibility and smoothness of running can be obtained than with any lesser number of cylinders, but we were careful to state how extremely important to the success of such engines is absolute synchronism between cylinder and cylinder. The article in question was also accompanied by three excellent illustrations of the 60 h.p. chassis, all of which—especially the large-scale view from above—will be found very useful in connection with the present fuller description of these extremely successful vehicles, for we are now able to give information of a more detailed character concerning their actual construction.



One of the latest 60-h.p. six-cylinder Napier Cars.

At that time, moreover, we had not had any practical experience on the road with the new 60-h.p. vehicle, and could not therefore speak from personal observation concerning its actual capabilities, although it was a foregone conclusion that the many improvements which were so noticeable in its design would make it an even more ideal car than the 40-h.p. model. Quite recently, however, we have been able to accept Mr. Edge's offer to place one of these vehicles at our disposal, and we then took a good long spin out into the country and back, handling the car ourselves for a considerable portion of the distance. To say that it fully came up to our expectations is but a mild expression of the only opinion that could be formed of its performance, for it is really astounding that any 60-h.p. car should be quite as easily controlled as—and far more comfortable than—most low-powered cars when travelling at a mere walking speed in traffic, and that there should yet be such an enormous amount of power available at a moment's notice. Even to-day, in spite of the wonderful developments that are known by all to have been made in petrol engine manufacture and in motor car construction, it must strike all motorists as marvellous that six cylinders having pistons 5 inches in diameter can be made to work in such perfect unison with one another—even when the engine is running at a speed well under 200 revs. per min.—that no one can detect the slightest indication of the individual impulses as they are transmitted from each cylinder in turn to the crankshaft. Although geared (with 36-inch wheels) to 55·42 miles per hour at the normal speed of 1,600 revs. per min., the car can be made to run—except of course when ascending a hill of very pronounced gradient—with absolute regularity, and never a miss-fire of the engine, as slowly as 5 or 6 miles per hour on the top speed, merely by closing down the throttle-lever. In a moment, however, it will accelerate, without noise or apparent strain, immediately the throttle is opened up, and then it is that the remarkably constant "torque" of this powerful engine is rendered so conspicuously apparent. Truly, it is not too much to say that the 60-h.p. Napier car enables the full benefits to be derived from an extremely powerful engine, and is at the same time totally free from the majority of drawbacks which have in the past been associated with vehicles having enormous engines. The metal-to-metal clutch, too, is largely responsible for the smooth running and easy control of this beautiful piece of machinery, for it slips just sufficiently when first brought into use to prevent any of those sudden shocks which are so unpleasant to the occupants and so detrimental to the whole mechanism, but it holds well when once the car is under way.

Of the three 6-cylinder models now being built, it is those of the live-axle type, in particular, that represent, at the moment, the last word of the Napier Company on motor car design, for, whereas the chain-driven 40-h.p. car is but little altered for the present year, the 60-h.p. vehicle is entirely new, and the live-axle 40-h.p. model is practically a cross between the two. Although, therefore, our illustrations will enable us to deal with, and show, the construction of all three models in this article, we propose to devote our attention chiefly to the 60-h.p. car.

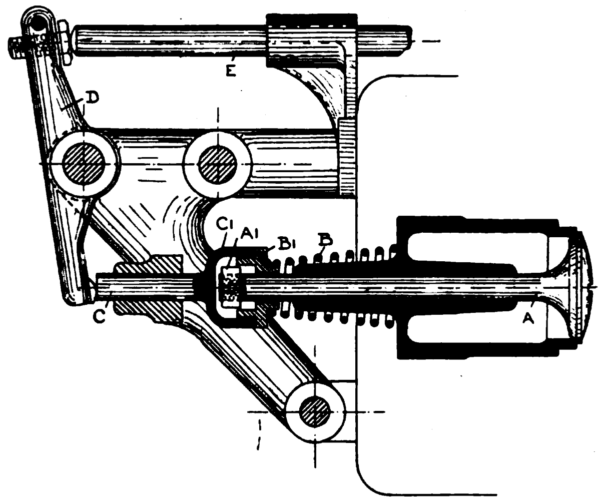
Initially, it may be stated that the 40-h.p. chain-driven car has a 9 ft. 8 ins. wheel-base with a 4 ft. 8 ins. track, and is fitted with 880 by 120 mm., and 870 by 90 mm. tyres on its rear and front wheels respectively. Except that the wheel-base is 10 ft. 4½ ins., the live-axle 40-h.p. model is similar in those respects. The 40-h.p. engine has cylinders of 4 ins. bore and 4 ins. stroke, and its mechanically-operated inlet-valves are above the exhaust-valves. On the 60-h.p. vehicle, however, the engine has all the valves arranged alongside one another, and the bore and stroke are 5 ins. and 4 ins. respectively. The wheel base of this car is 10 ft. 9 ins., and all four wheels have 880 by 120 mm. tyres. It is usually geared either so that it would run at 52·2 m.p.h., or at 72·5 m.p.h. on the top speed, when the engine is running at 1,600 revs. per min.

(*To be continued.*)

THE NEW DURYEA VALVE.

Readers of our issue dated October 31st, 1903, will recall to mind that in it we devoted a special article to the description of an inlet valve invented by Mr. R. E. Phillips, A.M.I.C.E., and used by him on his private car at that time. Since then, however, very little has been heard of this device, so it is especially interesting to find that the Duryea engines are being fitted with it for the ensuing season. Perhaps Mr. Phillip's own term, "Auto-mechanical" best describes its principle, which is that of having an atmospheric valve under positive control. Our illustration shows the device as fitted to the Duryea engine, and it will be noticed that the short rods, C, operate, not upon the valve spindle, A, but upon the valve spring, B. When relieved from the pressure of the spring, therefore, the valve is free to open atmospherically. An advantage claimed for this device is that it enables the engine to run better because it allows the valve to "time" itself somewhat for variations of engine speed. In action it differs from atmospheric valves pure and simple in that the valve is not under the constant influence of a spring, and it is also unlike an ordinary mechanically-operated valve in that it can, within limits, choose its own time for opening and closing. Theoretically, therefore, it neutralises disadvantages in both types, since it removes the necessity for using very weak springs, which need careful adjustment, and it also reduces the importance of extreme accuracy in "setting" the operating mechanism.

Instead of allowing the valve to be wholly atmospheric, however, the operating-gear is so made as to mechanically open and close the valve should it tend to stick. There is only a limited clearance, it will be noticed, between the end of the valve-spindle and the cap, C^1, of the rod, C, so the valve is very quickly pushed open if it does not move of its own accord. Similarily, the spring, B, positively closes the valve—through contact between the collars, B^1 and A^1—after the suction-stroke. In the Duryea engines, rock levers, D, are employed to transmit the motion from the push-rods, E; the valves being placed in the heads of the horizontal cylinders.



The Duryea Inlet Valve.—Drawing showing the new operating mechanism by which the push-rod acts first on the valve-spring instead of on the valve-rod—with the result that the valve itself is virtually atmospheric in action, although subject to mechanical control should it not operate properly of its own accord.

A Valuable Guarantee.

The Automobile Club still continues its useful activity in examining intending motor car drivers, and providing them with driving and mechanical efficiency certificates, which will be a guarantee to their employers that they possess a reasonable degree of competence. Some 2,000 certificates of this character were issued to owners and paid drivers up to the 31st of December, 1905, and the club anticipate that at least 10,000 will be issued during the present year. As inquiry into character is also made by the club before granting a certificate, the driver who possesses such a document proves, not only that he is a competent driver and mechanic, but also that he is a reliable employee. An important feature of the examinations is that they are held at a variety of different centres throughout the kingdom, and as the secretary of the club gives the fullest information on the subject, any candidates either in London or the provinces will be able to ascertain by letter when and where the nearest examination at which he can present himself will be held.

Scavengers as Expert Speed Witnesses.

Of all the funny witnesses that the police have ever brought forward to prove excessive speed on the part of motor cars, street scavengers may be cited as probably the weirdest. Their notions of pace, almost needless to say, are largely suggested by the dust and mud carts with which they are familiar. Such a case occurred recently at Aberdeen, where a local citizen was hauled before the Sheriff and charged with driving at excessive speed, to wit, upwards of twenty miles an hour. Among the witnesses against him were three scavengers, who declared that they beheld the car proceeding along the street at an excessive rate of speed. In cross-examination, one of the scavengers was asked what he thought the speed actually was, and declared (naturally enough amid "laughter") that it must have been quite four miles an hour. Others, however, maintained that it was twenty-three miles an hour, and Sheriff Begg, disregarding the evidence of the first scavenger, and more or less "begging the question," convicted the accused and fined him £3. After this, as the schoolboy said, "What need have we of any further false witnesses?"

THE FIAT COMMERCIAL VEHICLES.

It is one of the best auguries for the ensured success of the motor 'bus movement, that those very firms who are in the front rank of motor pleasure vehicle construction, should be already bringing their practical experience to bear on the design of thoroughly sound chassis suitable for withstanding the much more severe and prolonged strains imposed on commercial vehicles

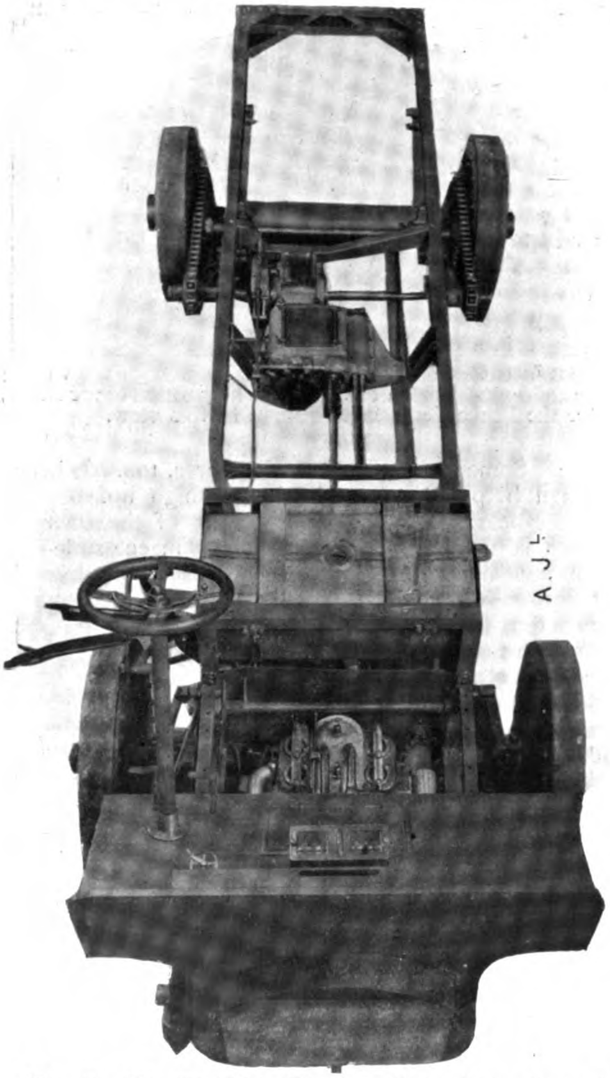


Fig. 2.—The Fiat 'Bus Chassis. View from above of the 24-h.p. 'Bus Chassis, showing the general arrangement of the mechanism.

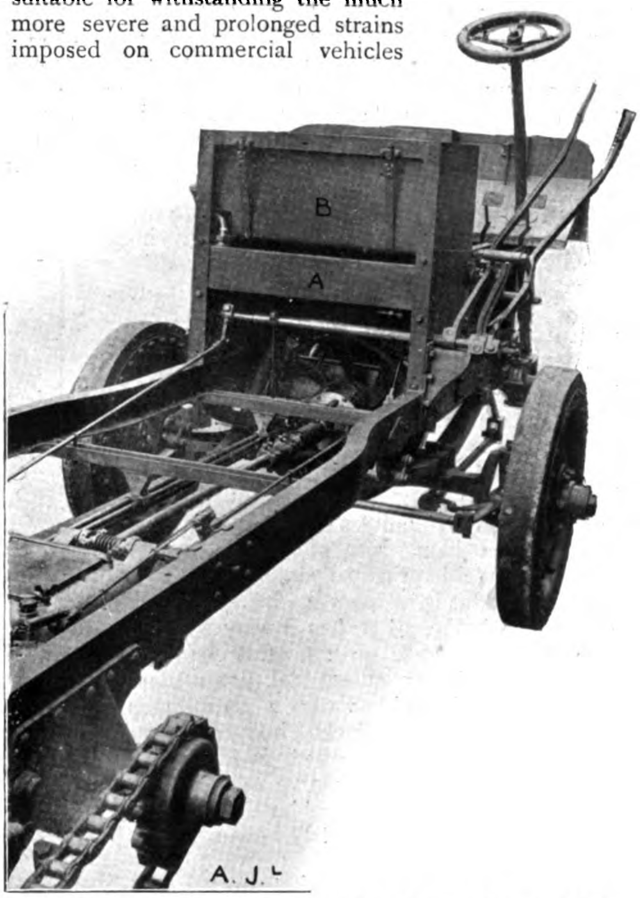


Fig. 3.—The Fiat 'Bus Chassis. View showing the position of the Petrol Tank, B, also the Water Tank, A, for cooling the Foot Brakes. The Steering Heads and Tie-bar are also visible in this illustration, which gives prominence to the arrangement of the Change-speed and Brake Levers.

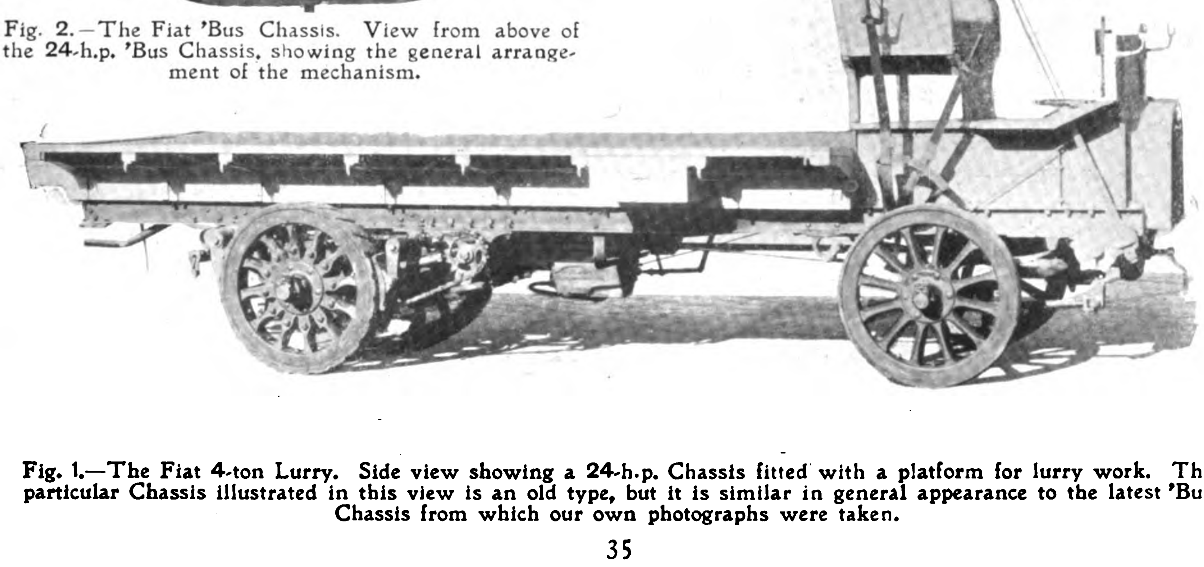


Fig. 1.—The Fiat 4-ton Lurry. Side view showing a 24-h.p. Chassis fitted with a platform for lurry work. The particular Chassis illustrated in this view is an old type, but it is similar in general appearance to the latest 'Bus Chassis from which our own photographs were taken.

—especially those used for public service work. For some time past the Fiat Company have ranked among such go-ahead firms, and the heavy vehicles which they have constructed have done yeoman service in their own country, where they have been extensively employed by the Italian Army. But these vehicles have only recently been brought to this country, and were publicly exhibited for the first time, by Fiat Motors, Limited, at Olympia. They are, at present, like the Fiat touring models, made in two sizes, and the engines with which they are fitted are similar to those used for the touring cars. The smaller vehicle —which, like the other, is of the chain-driven type—has the 16-h.p. engine, while the 24-h.p. motor is fitted in the larger model; both chassis have disc-clutches and four-speed gear-boxes of the standard Fiat pattern. As these parts, however, have been very fully illustrated and described in THE AUTOMOTOR JOURNAL of July 22nd last, it will not be necessary to again refer in detail to them now.

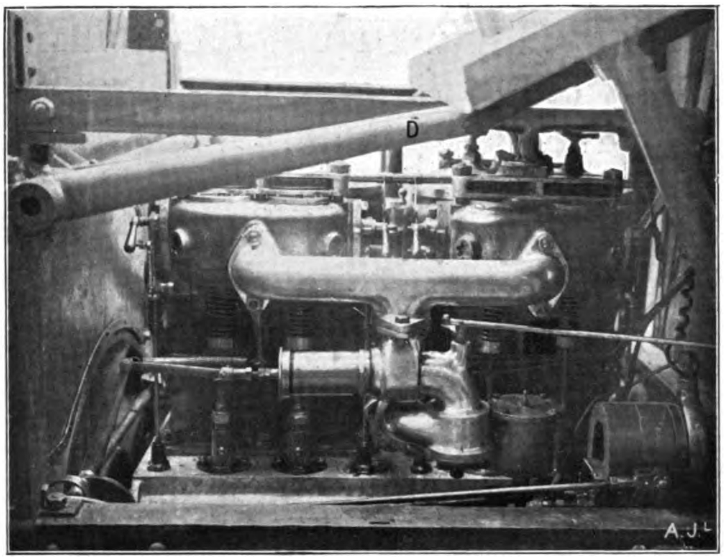


Fig. 6.—The Fiat 'Bus Chassis. View of the 24-h.p. Engine, showing the Carburettor and Low-Tension Magneto. The position of the Lever, D, for the Brake Pedal is prominent in this view.

For the 16-h.p. model a pressed steel frame is provided, and it resembles in general appearance —as will be evident from Fig. 8—a touring chassis; in fact, this model is principally intended for use as a station omnibus, and it is, of course, eminently suitable also for a shooting brake, as it has a very smart appearance. The 24-h.p. model, on the other hand, has a rolled steel frame of very substantial proportions, and it is capable of acting either with a platform, as a four-ton lurry or, with a double-decked body, as an omnibus.

The heavier chassis—which is illustrated in Figs. 1 to 7—is naturally of very large overall dimensions, and in order to reduce the wheel-base, which now measures 10 ft. 2 ins., the front axle has been set back behind the engine. Some economy of platform area, too, has been obtained by placing the driver's seat high up, so that the floor-boards below it form the top of the bonnet. Neither is the engine rendered really inaccessible by this arrangement, for one of the boards is removable, and the entire sides of the bonnet can also be readily detached. Our photographs in Figs. 6 and 7 were taken with the engine *in situ*, so they give some idea of how much of it can be easily got at from outside.

Of the four-cylinder type, the engine has a bore and stroke measuring 125 mm. and 150 mm. respectively, and it is capable of developing about 40-h.p. The cylinders are cast in pairs, and have the inlet and exhaust valves arranged symmetrically on either side, with the low-tension igniters set sideways into the inlet valve chambers. Inspection covers are provided above all the valves, and are held in place by yokes to facilitate their quick removal. In front lie the gear wheels which

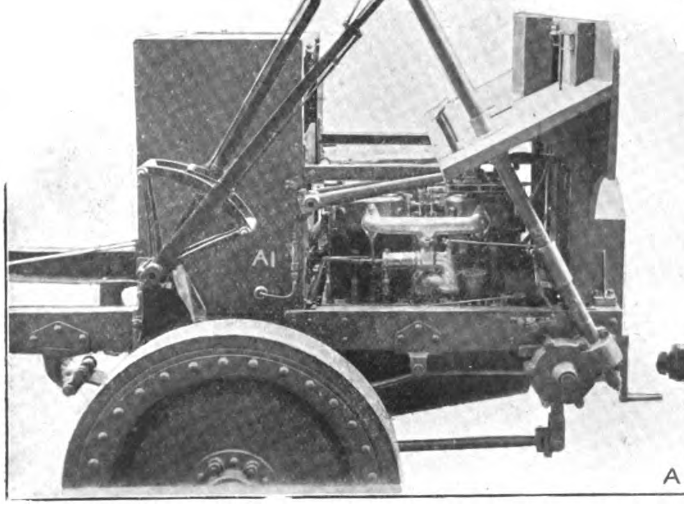


Fig. 4.—The Fiat 'Bus Chassis. Side view of the front portion of the Chassis, showing the position of the Engine and the arrangement of the Steering Gear. Near the change-speed lever quadrant is the little valve, A^1, which is interconnected with the brake-pedal for the purpose of controlling the water supply to the brake drums.

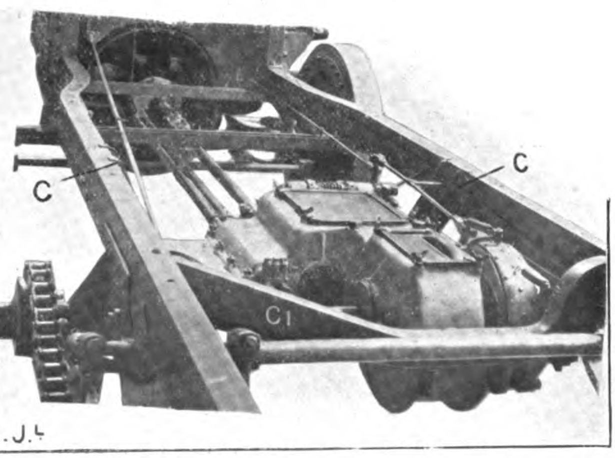


Fig. 5.—The Fiat 'Bus Chassis. View showing the arrangement of the Gear-box, which has a three-point suspension, being carried in front by independent brackets, C, attached to the Frame, and behind by the specially-bent transverse member, C^1.

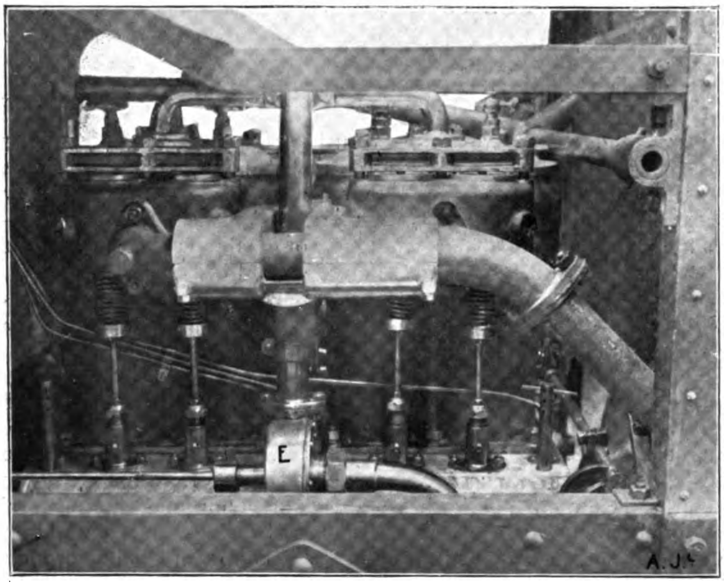


Fig. 7.—The Fiat 'Bus Chassis. View of the Engine from the left, showing the Circulating Pump, E.

drive the cam-shafts, and on one side of the engine is the low-tension magneto, while on the other is the circulating pump, each being driven by an independent spur-wheel in mesh with that on the end of the cam-shaft adjacent to it. In order to bring the pump, E, into a more accessible position than usual, and to simplify the pipe connections, it is mounted in a very prominent position on the crank-chamber. In Fig. 7 it will be noticed how conveniently the pump is situated both for inspection and also for eliminating awkward bends in the water pipes.

In front is the usual honeycomb radiator, and above this rests the dashboard which carries the Fiat mechanical lubricator. The steering-column, which has a convenient rake, passes to one side of the bonnet, and the worm and sector gear at its lower end, is attached to the side of the frame. From this the connecting-rod passes backwards to the steering-knuckles, which are coupled by a tie-rod lying behind the axle.

Both change-speed and brake levers are mounted on a bracket to the right of the driver, who controls the engine by a throttle lever situated above the steering wheel; the low-tension magneto ignition is regulated automatically by the engine, as it is on all Fiat cars. The clutch-pedal is interconnected with the brake-pedal, but the side-brakes, which are of the internal expanding type, are quite independent. Two compensated brakes on the second motion and differential shafts respectively are operated by a pedal, and their drums are water cooled from a tank, A, situated close to the petrol tank, B, which is under the driver's seat. This water supply is regulated by a valve, A1, Fig. 4, which is interconnected with the foot pedal.

Suspension of the frame has received careful attention, and the springs are of considerable length. On the chassis, illustrated in Figs. 2 to 7, pressed steel wheels with iron tyres are fitted, it will be noticed, but for 'bus work the ordinary rubber-tyred wheels would, of course, replace them.

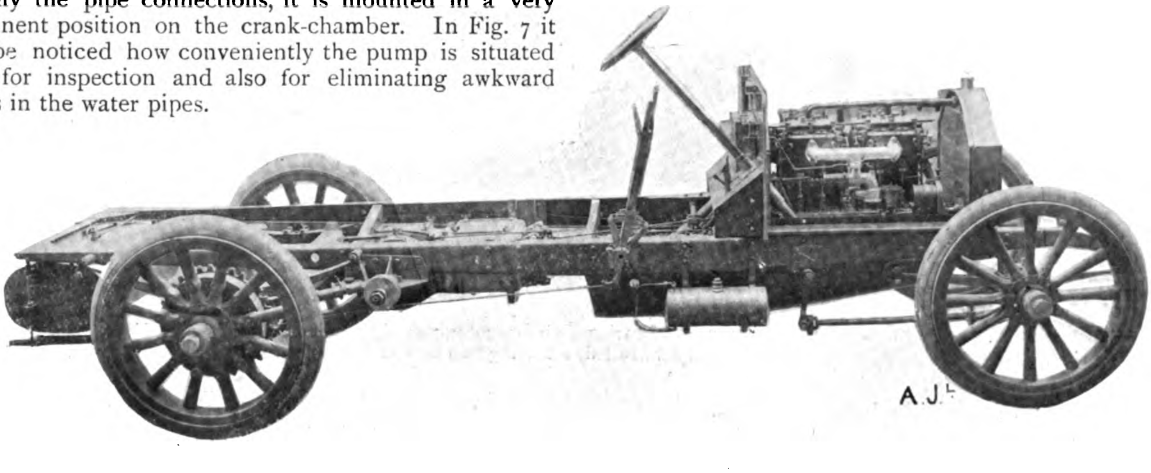


Fig. 8.—View of the 16-h.p. Fiat 'Bus Chassis, which has a pressed-steel frame and is constructed on practically the same lines as the ordinary Touring Model.

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To train Car Drivers.

THE dearth of competent drivers of British birth is emphasised by a recent incident. The Motor Union asked the London County Council whether they would be prepared to support financially some comprehensive scheme to provide training for motor car drivers. It appears that the only London County Council institution in which such instruction is provided is that of Battersea. Nevertheless the Education Committee has, we understand, adopted the view that the required training would be more economically and efficiently provided by utilising some of the London polytechnics and technical institutes.

Motor Houseboats.

A HOUSEBOAT on wheels propelled by motor power has always appealed to popular imagination and has already inspired the attempt to form an institution for their use under the title of "Home Car Club." A vehicle of this kind which presents some of the features of an enlarged touring car is being utilised in Paris. It is sufficiently mobile to take a large party to the theatre and jog leisurely home with them again. Speed is a secondary consideration, as the size and equipment of the vehicle are such that whenever its occupants feel inclined they can stop on the roadside or a suitable field and pass the night in all comfort, resuming their journey next day—or next week.

THE HOFFMANN BALL-BEARINGS FOR MOTOR CARS.—PART I.

ONLY a year ago manufacturers and others held very diverse opinions concerning the merits or demerits of ball-bearings in motor car design, and it was by no means the usual thing for cars in general to be fitted with them. Nowadays, however, the automobile engineer has been fully convinced of the great advantages that are derivable from their employment, with the result that there are to-day comparatively few cars on the market having plain bearings for the road-wheels or for any of the revolving shafts in the transmission mechanism. He has, during the past year or two, in fact, been able to obtain ball-bearings that are thoroughly reliable for supporting a considerable amount of weight and are able to withstand really hard work continuously, whereas formerly mechanical defects of design and construction rendered unsatisfactory such ball-bearings as were then available. It is not that motor car designers have not appreciated the possibilities of such bearings for a considerable period, for it has always been freely admitted that they offer less friction to *starting* than do ordinary bearings, that they suffer least from neglect in lubrication, and effect a saving of power.

It is not at all surprising, however, that very grave difficulties should have been encountered in producing thoroughly satisfactory ball-bearings, because so very much depends upon precision of workmanship and hardness of material, to say nothing of the further question of actual design that is of such vital importance to obtain the best results. And it is obvious, too, that any such bearings must be turned out in extremely large quantities if they are to be sold at anything but a prohibitive price. Early failures, or only partial successes, are only what might reasonably have been expected until an enormous amount of experimental work had been conducted, and much invaluable data obtained. While, even after that, a considerable amount of time and capital obviously had to be expended in the equipment of the necessary works, with costly special plant for accurate manufacture in large quantities. Even the manufacture of perfectly true, absolutely interchangeable, and equally hardened, steel balls, is in itself no easy matter, and yet the balls themselves are usually regarded as being the simplest portion of a complete bearing.

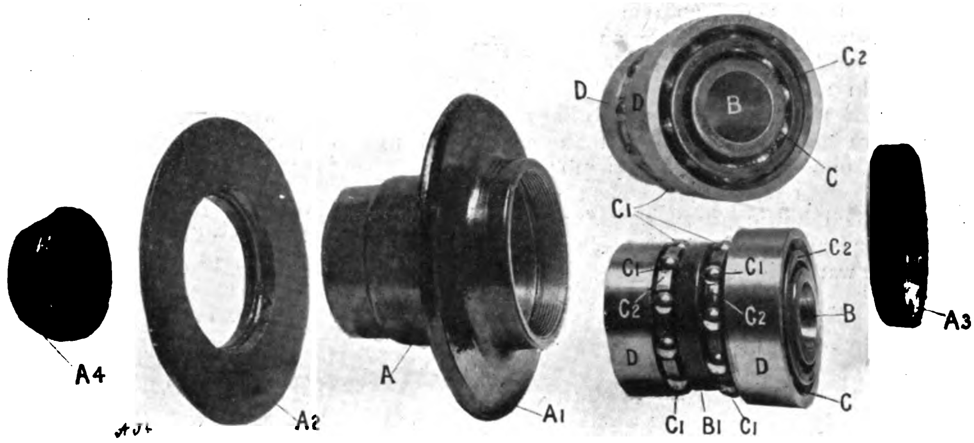

FIG. 1.—The Hoffmann Ball-Bearing Hub for motor cars of the chain-driven type. Views of the chief component parts dismantled, including two different views of the ball-bearing proper.

It is now some little time since development in this direction enabled manufacturers to supply reliable ball-bearings for such comparatively light work as bicycles, and the result has been that no builder of such machines ever thinks of using any other form of bearing now. But the conditions under which such bearings have to work become vastly more severe when used on machinery of heavier kinds, so that any slight inaccuracies of construction—or any faultiness of design—are sure to lead to trouble; and trouble with a ball-bearing is serious.

Of recent years, an enormous amount of progress has been made by the ever growing number of firms who have devoted their energies to the task of solving this difficult problem, with the result that ball-bearings of large size are now being made for high-speed machinery of all kinds, and for the wheels—as well as the transmission mechanism—of automobiles. Prominent amongst these concerns is the Hoffmann Manufacturing Company, who have spent an enormous amount of money in evolving satisfactory bearings, and have built and equipped an extremely large factory at Chelmsford for this express purpose. They have, during the past two or three years, been quietly conducting exhaustive experiments with special bearings of the larger sizes, and have for some time acquired an invaluable reputation—both in this country and abroad—for the exceptionally perfect balls which their special methods of manufacture have enabled them to turn out—balls which have done much to improve the bicycle of to-day, and have, moreover, been of immense value to not a few makers of motor cars.

The works—although in England, and although equipped with English-built machinery(!)—are laid out and conducted upon what are popularly supposed to be exclusively American up-to-date lines, and are certainly one of the best organised factories that it has been our pleasure to visit. The special machinery installed turns out automatically the rough balls from rods of steel, the tools in the lathes machining them all over during this single operation. Subsequently they pass through various operations—which are naturally of the nature of trade secrets—and finally the balls emerge polished and finished, so absolutely spherical and true to size that they can be guaranteed by the company to be within $\frac{1}{10000}$ of an inch of standard measurement. One of the most important of the processes is that which ensures equality of the tempering during the operation of hardening.

Until a year ago, the only standard types of complete bearings that the Hoffmann Company were able to supply for motor car work were the thrust-bearings, with which they have been so successful for a variety of machinery. Since then, however, they have introduced several different patterns to suit each and every part of the entire transmission mechanism, and have, in particular, given special attention to the design of ball-bearing hubs for the road wheels. Each of these types is made in several sizes, so that the company can meet the requirements of those building cars of any kind.

It is to the hubs that we first propose to devote our attention, before passing on to the other forms of Hoffmann bearings that are equally applicable for automobile work, and of these we shall in the first place describe the construction of that type which is specially intended for vehicles having stationary axles—the rear wheels being driven by side chains. In the main, the hubs for cars having "live" axles are also of similar design, so that those hubs will be more readily understood afterwards, and the difference between the two distinct types—which the company are making—will be more easily explained then. In all these hubs, four rows of balls are employed, two of which take the weight of the car and the other two take the thrust.

One of their most interesting features is that the ball-bearing proper can be completely removed, and that it can then be even roughly handled without fear of the balls dropping out. By an extremely neat bit of designing—coupled with great accuracy of workmanship—it can, however, be taken to pieces without difficulty, and, with equal ease, be put together again. Other essential characteristics are the cages that are employed for preventing the balls from running in contact with one another, and the way in which the races are arranged so as to give but two contact points to each ball, of which features we shall have more to say later, when dealing with the general design of the Hoffmann bearings. The shape of the races, in combination with the cages, is such as to hold all the balls in place, and it is particularly important to recognise the fact that no adjustments whatever are provided, since it is unnecessary to make any provision for taking up wear.

The "Fixed" Axle Type of Hub.

Of the accompanying illustrations, which show the ingenious construction adopted, Figs. 1, 2 and 3 refer to the stationary axle type of hub. In Fig. 1, the axle-cap, A^4, has been taken off the main housing, A, and the flange, A^2—between which and the flange, A^1, the spokes are bolted—has also been slipped off, while, at the other end, the threaded collar, A^3, has been unscrewed, and the complete ball-bearing forced out. The ball-bearing proper is, in this illustration, shown from two different points of view.

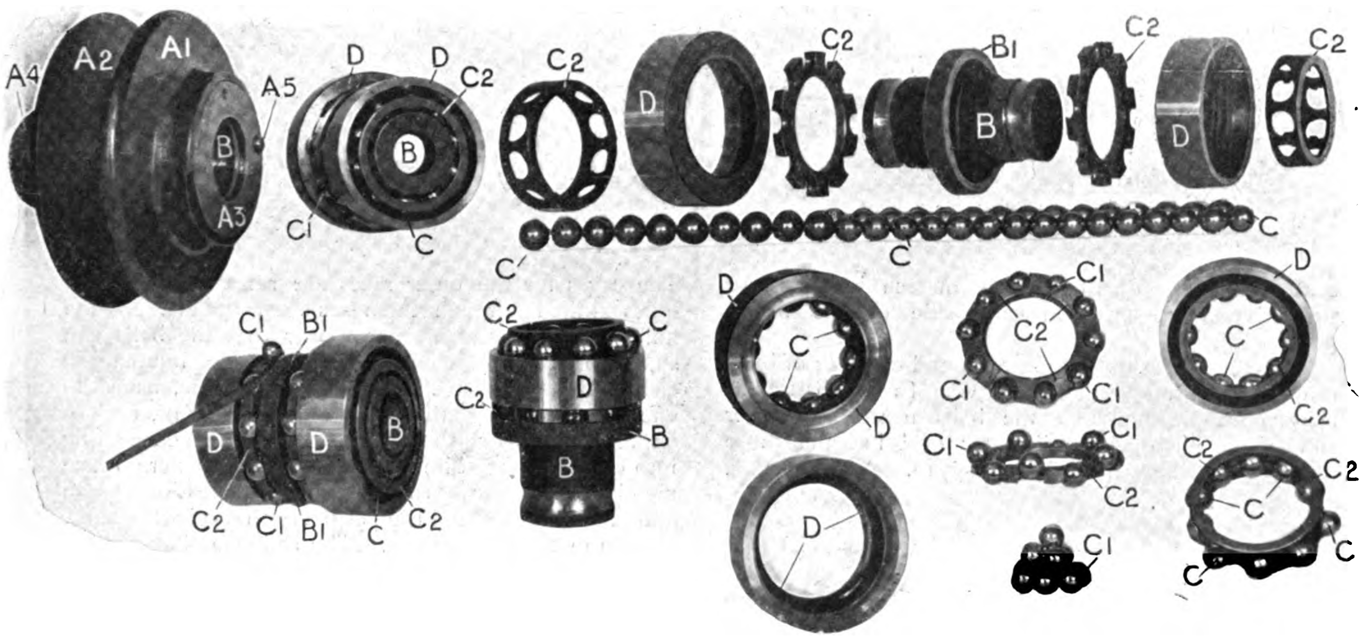

FIG. 2.—The Hoffmann Ball-Bearing Hub. Views of the complete hub of the ball-bearing proper, and of all the component parts separately; also two views showing the method of removing the balls, and other views demonstrating the design of the cages in relationship to the balls.

In Fig. 2, the complete hub is shown to the left at the top of the illustration, and, in addition, all the component parts of the ball-bearing proper are shown in such a way as to render their shapes and positions clear, while the two views in the left hand bottom corner serve to demonstrate the manner in which the bearing itself can be taken to pieces when required.

The upper half of Fig. 3 is a longitudinal cross-section through the entire hub, and shows the tapered end of the stationary axle, E, in place inside it. The lower half of the illustration is in elevation. By comparing this drawing with Figs. 1 and 2, the entire construction can be followed.

Referring to these illustrations, the central portion, or cone, B, of the ball-bearing has a tapered hole bored through it, and it is this part that fits over the end of the stationary axle, E, to which it is held rigidly in place by the locked nut, E^1; the complete hub with the wheel can at any time be removed from the axle by taking off this nut. The cone, B, which is made of the finest hardened steel, has the four ball races ground upon it for the four sets of balls. The races near each end take the form of grooves that are cut down into the cylindrical face, whilst those near the centre—for the thrust portion of the bearing—are slightly concave faces in each side of the flange portion, B^1.

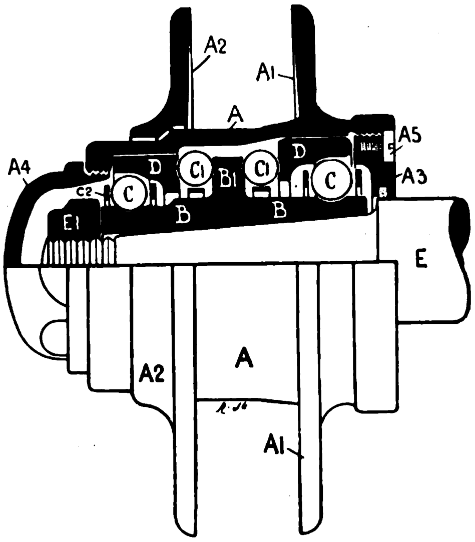

FIG. 3.—The Hoffmann Ball-Bearing Hub for cars of the chain-driven type. Half longitudinal cross-section and half elevation.

There are ten balls to each race, and each set of balls is arranged in a retaining cage, C^2. In the particular bearing examined by us, the balls nearest the inner end of the hub have a diameter of $\frac{1}{2}$ in., and those forming the three other sets are $\frac{7}{16}$ in. All the cages, C^2, which are of phosphor bronze, are of very special construction. Primarily they play the extremely important rôle of preventing the balls from rubbing against one another, and thus they save the unnecessary friction that would otherwise be set up between the rubbing faces, which run in opposite directions to one another.

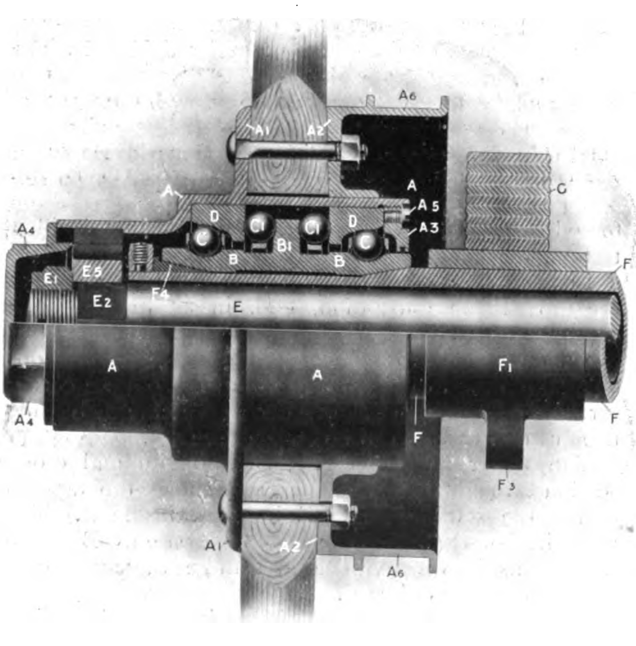

FIG. 4.—The Hoffmann Ball-Bearing Hub for cars of the live-axle type, in which the weight of the vehicle is *not* taken by the "live" shafts. In the upper half of the illustration the hub is cut away to show the internal construction.

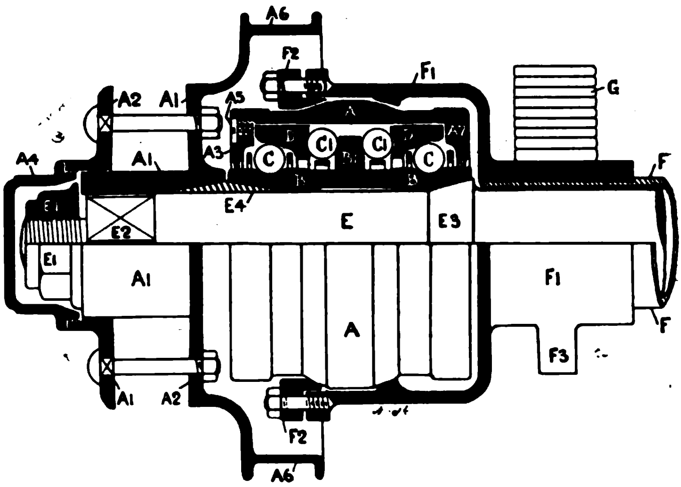

FIG. 5.—The Hoffmann Ball-Bearing Hub for cars of the live-axle type, in which the weight of the vehicle is taken by the "live" shafts. The upper half is a true longitudinal cross-section through the entire hub, and in the lower half the external portions only are shown sectionally.

The cages for the outer races are rings with tapering holes drilled through them—as seen in Fig. 2.—the holes being tapered in such a way that the balls can slip into place in them from the outside, but cannot enter from the inside. The balls, therefore, have the effect of centring the cages about the shaft, and of entirely supporting them so as to prevent their coming into contact either with the cone, B, or the external race members, D. The cages for the inner races are disc-shaped, and are slotted around the periphery to receive the balls, as seen in the illustrations. The slots may be regarded as tapering holes that are drilled through the discs so near to the periphery that they cut right through it. Each alternate slot is tapered in the opposite direction, so that half of the balls have to be slipped in from the one side and the other half from the other side—as rendered evident in Fig. 2. By this construction, the balls centre the cage about the shaft, and also cause it to run true with the ball races, without its touching either the central portion, B, or the external shells, D.

The shape of the external members or shells, D, of the ball-bearing is clearly shown in the illustrations, where it will be noticed that these shells are turned cylindrical outside, are open in front, and have the races turned on the inside, and on the back faces, for the "load-carrying" and the "thrust" bearings, respectively. Externally, they are turned to an absolutely true fit to suit corresponding faces inside the hub portion, A, into which the ball-bearing proper is introduced as a complete unit from the inner side. When slipped in in this way, the smaller shell comes up against a shoulder—as seen in Fig. 3—and the larger shell is forced in to precisely the correct distance away from it by the collar, A^3, that is afterwards screwed into place. It will be noticed that the collar, A^3, in reality forms an adjustment for the ball-races, but it is made once and for all in the factory, and the small screw, A^6, that locks the collar, is so arranged that it can only be introduced when opposite a single slot, cut for it in the hub, A; there is therefore no chance that the inexperienced will be misled into attempting to adjust the bearing.

The inner face of the shells, D, is curved in the immediate vicinity of the balls, C, and the mouth is cut away at a sharp angle to allow the bearings to be taken to pieces—in the manner that will be described presently. The face at the back of the shells is, for the most part, flat, but the actual races themselves are slightly curved. The shells, D, do not, of course, touch the cone portion, B.

From what has already been said, the actual construction of the ball-bearing proper will have been made quite clear, but it is quite another matter to see how it is possible to put it together or to take it apart again. It is obvious that, when the races are pressing up against the balls, C^1, none of these balls could be removed—even if their cages were not there—and it is also clear that the balls, C^1, must be removed before it is possible to take out the outer balls, C. It is, as a matter of fact, however, extremely easy to take the bearing to pieces, although there is no chance of its *falling* to pieces after it has been removed from the hub. This is provided for in the design, but has only been rendered possible by the extremely high-class and accurate workmanship employed.

The actual operation of taking the bearing to pieces is rendered clear by the two views to the left in the lower part of Fig. 2. The outer ball-races are so shaped as to allow a certain amount of end play of the shells, D, and this end play is just sufficient to permit one of the balls, C^1, at a time to be forced up outwardly, between the races and past the cage, by inserting some such instrument as a knife beneath it. The ball neither drops out, nor, on the other hand, is there any chance of damaging the bearing in forcing it out; it just jumps out, and acts exactly as though it had been held between two powerful springs; similarly, when replaced, it flies in with a click. Half the balls, C^1, in each race are, of course, taken out from the one side of the cage, and the other half from the other side. The internal shape of the shells, D, is such that, after having removed the balls, C^1, each set of balls, C, together with its cage, can pass out over the end of the cone, provided that the shell, D, is, at the same time, allowed to slip back in the opposite direction. There is then just room for the balls—as they are wedged outwardly through the holes in the cage—to clear the mouth of the shell, in the way they are doing in our illustration.

It will be understood that the hub, A, is constructed to suit artillery wheels of the ordinary type, the spokes being secured to it by bolts that pass through the fixed flange, A^1, and the detachable flange, A^2. It is also made to take wire spokes, in which case it is provided with two fixed flanges for that purpose. The entire bearing is rendered dustproof by the usual screwed cap, A^4, on the outside, and by a felt washer fitted into the groove seen in the collar, A^3, on the inside.

(*To be continued.*)

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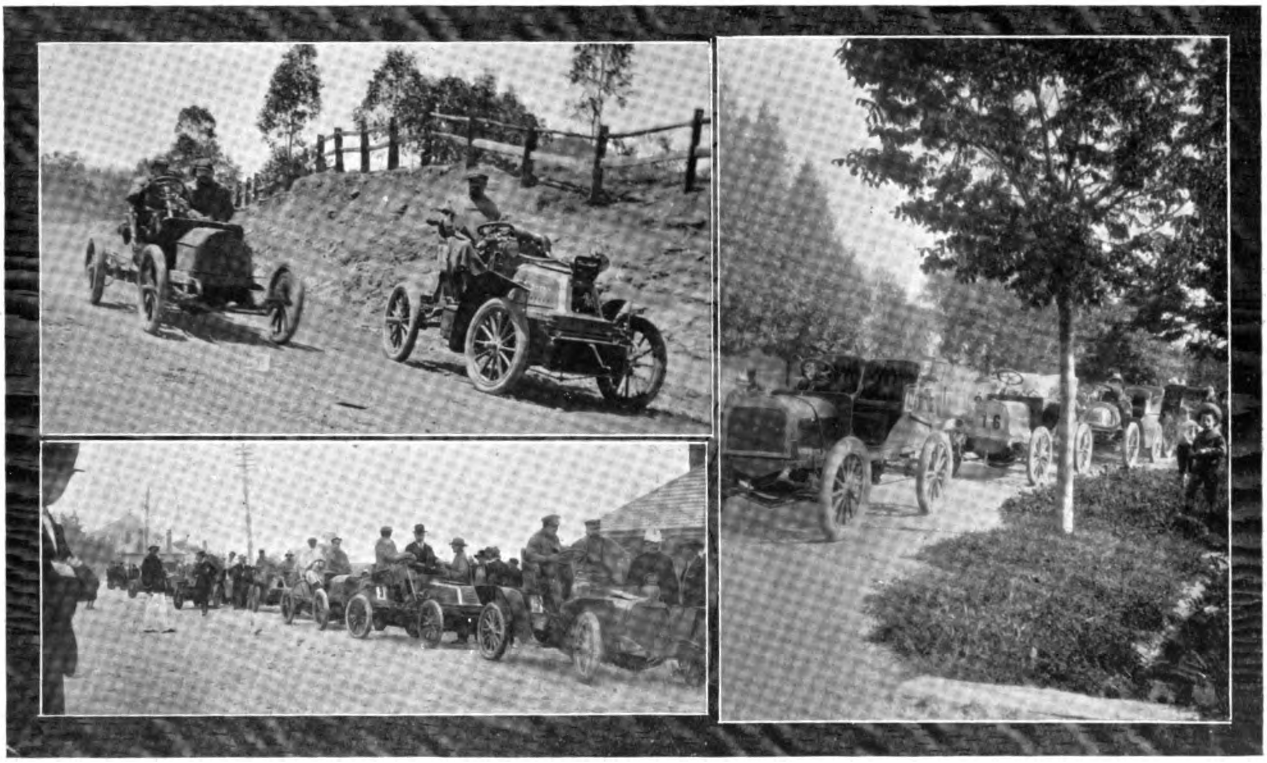

(1) G. Hobbs on his Mercedes Car, near Penrith, N.S.W. (2) The competing cars lined up in Albury Control. (3) The cars ready to start in the Dunlop Contest from Strathfield Control (10 miles from Sydney) for the finishing procession to the Sydney Agricultural Grounds.

MELBOURNE-SYDNEY RELIABILITY TRIALS.

AERONAUTICS.

A Prize for British Aeronauts.

WITH a view doubtless of encouraging experiment in aeroplane flight in this country, and in the hope that Great Britain, if not first in the field, may come in a good second or third, Sir David Salomons, Bart., who is a life member of the Aero Club, has offered a valuable prize to that body for the first mechanically-propelled aeroplane which flies a certain distance successfully through the air (we presume carrying an aeronaut), and returns to the point of departure. So far, British experimenters have been rather conspicuous for their omission to attempt the conquest of the atmosphere on the aeroplane principle. Of course, there were the experiments many years ago of Sir Hiram Maxim near Wembley Park, which adequately demonstrated—though the fact of the demonstrations has been pretty generally neglected since—that an aeroplane, driven by a powerful motor operating suitable propellers, was well able to lift itself, motor, and a load, and there have been. quite recently we believe, some experiments in the Isle of Wight, carried out by Dr. Barton and Mr. F. L. Rawson. In addition to these, there were what we may call the classic experiments of Pilcher, with a multi-cellular aeroplane or gliding machine that resulted in his premature death. These few instances sum up practically the whole (with the exception of experiments with mere models) of serious British contribution to the solution of the problem of flight on the heavier-than-air principle. It is rather strange that this should be so, and it is possible that British experimenters may be encouraged if they consider in some detail the history of the Wright Brothers' experiments.

The Wisest Course to Follow.

WHATEVER view may be held as regards the exact distances *they* have flown, the precise speeds attained, or the number of flights they have accomplished, there can be but little doubt that they have accomplished extended free flight with a motor-driven aeroplane. It is instructive, therefore, to call to mind the gradual steps of their progress. Their first experiments, carried on for several years, consisted entirely of gliding with a machine which might be described as a Chanute aeroplane, that is, a double-decked arrangement with curved surfaces, to which they added their special inventions of a forward rudder and a vertical tail. They themselves attributed (and there is little doubt that they were correct in doing so) the success of the earlier experiments, and the mastery they obtained, of "gliding" to the favourable characteristics of the district in which they experimented—the Devilkill Hills, on the coast of North Carolina, which are in fact big sand hills overgrown with grass. On these hills for many months in the year a regular easterly wind blows off the Atlantic, often averaging 20 miles an hour in speed for weeks together. They were able to obtain almost any slope on these hills that they required. If they came down unexpectedly on the soft surface of sand and rank grass no injury was done. and they could rely for long periods together on obtaining just the sort of wind they wanted.

Aeroplane Manipulation.

THERE are some grounds for believing that the actual manipulation of a motor-driven aeroplane in the air, so far from being more difficult than managing a gliding machine, is, as a matter of fact, rather easier, but we seriously doubt whether anyone will ever learn to accomplish it unless instructed by someone who has learned the art before him, or unless he has previously learned to "glide," although the mere fact that flight has now been proved possible makes an enormous amount of difference. If no one had ever seen a man ride a bicycle the possibility of maintaining oneself in equilibrium on two wheels arranged tandem would be frankly and sincerely doubted, and first experiments would convince anybody in a short time that it was impossible, *unless they knew it could be done.* Knowing it can be done, people learn with comparative readiness, and now that it has been done, there will probably be more success in manipulating aeroplanes in the air.

A Suitable Spot for Experiments.

ALL the same, the most promising line of experiment to adopt is that which has been proved to be successful, *i.e.*, to begin with gliding. Now it so happens that there is a district in the south of England, which if not quite as ideal for the purpose as the Devilkill Hills, presents many of the very same advantages. We refer to the chalk downs of Sussex, particularly where they sink towards the strip of alluvial and tertiary deposits that begin eastwards near Shoreham and gradually widen out towards Chichester and Selsey Bill. Here rounded hills sloping in nearly every direction and with almost every degree of inclination to the horizontal can be found in abundance. They are covered with soft and springy turf, and are almost entirely treeless, while for many weeks in ths summer, often enough, a steady south-west wind blows off the sea. This is a spot that nature would seem to have designed for the British experimenter to learn to glide. So many of the hills have but a moderate slope that the same district would probably provide plenty of sites on which subsequent experiments with motor-driven machines could also be attempted. If, however, for these later developments a flatter *terrain* were desired, the very spot for the purpose is Salisbury Plain. As the Sussex Downs are nice and secluded, and one can often walk for miles without encountering other specimens of *homo sapiens* than a solitary shepherd, it would seem to be the ideal spot for experiments of the kind.

An Opening for Sportsmen.

WHY sport-loving athletes have not taken it up has always been something of a mystery. A gliding machine is cheap to build; only pluck and address are needed for its manipulation. Conquest of the air by its means should, one would think, prove at least as amusing, certainly more exciting and worth accomplishing, than proficiency say at golf, and an intelligent and athletic experimenter would probably accomplish all the Wright Brothers have effected in less time than many people have devoted during the past few years to the more or less successful cultivation of the Scottish national game. Of course, the sport is not unaccompanied by danger. As Mr. Chanute said, on one of the few occasions on which he spoke publicly in this country, there *is* danger, though with the pluck to adopt the horizontal position which the Wrights adopted, and which he modestly admitted he never was himself sufficiently adventurous to attempt in the thousand successful glides which stand to his credit, it is reduced to a minimum. But a spice of danger is what the true sportsman loves, and nothing great is ever accomplished without perseverance, resource, and, often enough, risk.

More Wright Rumours.

The Wright question still continues to attract a good deal of attention among our contemporaries, particularly in France, though little further light has been thrown upon the situation. That is not to be wondered at, as it is admitted that the Wright Brothers have finished their experiments for the season, and dismantled their machine. A statement has appeared on the authority of the *New York Herald* to the effect that Mr. Arnold Fordyce is negotiating with the Wright Brothers for the disclosure of their invention, including presumably whatever patent or other rights they may possess, and that amongst the conditions of the agreement which he has made, is that the Wright Brothers are to give demonstrations with their flying machine within three months' time, and that they undertake to cover 50 kilometres from the starting point without touching or communication with the ground (and returning presumably to the starting-place) within an hour. Mr. Fordyce declared that after the agreement had been concluded, the Wright Brothers showed him photographs of their machine in full flight, which thoroughly astonished him. We hope this is all a correct statement of facts, as, should it be so, the result will probably be that the Wright Brothers will have to come across to France to demonstrate their invention, and when they are there, they might as well condescend to pick up the trifle of £2,000 constituting the Deutsch-Archdeacon Prize of the French Aero Club. This they should be able to do without difficulty, as all that is required is to start from a given point, sail round a stake, or other obstacle such as the Eiffel Tower, half a kilometre distant, and return to the point from which they set out. It is much easier to get to Paris than to Dayton, Ohio, and if the event is announced for any particular day, there will probably be a considerable emigration of aeronauts and others interested in the question from the British Islands to the city of the Seine to witness its accomplishment.

One-Sided Criticism.

In the meantime there has been a good deal of acrid criticism of the accounts which have been published of the Wright Brothers' performances, in journals across the Channel which do not happen to have sent representatives to investigate the question on the spot. These rather captious critics seem to forget that the question as to whether the Wright Brothers actually flew 2 miles or 20 is relatively unimportant, for if they flew 2 miles, it is certainly only a matter of time whether they will be able to fly 20 or 200, and a lot of fuss has been made about the apparent impossibility of accomplishing a speed of 100 kiloms. an hour with a motor developing only 15-h.p. As a matter of fact, the Wrights distinctly stated that their motor developed 24-h.p., and though Mr. Weaver in his report stated its power to be 12 to 15-h.p., he is evidently under some misapprehension, that having been the power of the motor with which the Wrights performed their first free flight in 1903. Nobody has ever stated, and they have never claimed, to have accomplished a speed of 100 kiloms. an hour. Sixty kiloms. was their maximum except at the end of their experiments, when they just reached 40 miles an hour. To set up a cardboard lion on the stage and knock it down yourself with a club is a trick as old as the days of Nero, but it is not treating the question either fairly or ingenuously to take one account which minimises the power of the motor employed and another which, without any authority whatever, nearly doubles the actual speed attained, and from the two combined to attempt a *reductio ad absurdum* of the main contention.

The French Army secures the Lebaudy Airship.

Everyone who has followed the splendid record of the Lebaudy airship, more particularly the successful and reliable manner in which it carried out its military evolutions under the supervision of the French military staff at Chalons and Toul, will be pleased to learn that the French Government has taken over the great machine, and that it has now definitely passed into the military service of its country. The airship is now ensconced in the fortified camp surrounding Toul. It is understood to be ready to take the air as soon as re-inflated, and reconnoitre any suspicious movements in the neighbourhood or, presumably, on the other side of the Rhine at a moment's notice. With the most praiseworthy patriotism and singular generosity, the owners of the great airship, Messrs. Paul and Pierre Lebaudy, have in this way dedicated it to the service of the nation. Considering the enormous sums that they have spent on its perfectation, they are certainly showing an example of the highest devotion to the interests of their country.

It is of interest to learn that Messrs. Lebaudy's works at Moisson, where the present airship was built "from truck to keel," are already busy with the manufacture of another airship, the Lebaudy of 1906.

MELBOURNE-SYDNEY RELIABILITY TRIALS.—Finishing up the run of 1,276 miles at Coburg Control near Melbourne. S. Day on his 8-h.p. De Dion passing the finishing point.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THE SHOW QUESTION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In your issue of the 23rd ult., Mr. Charles Newton refers in a letter to the British Empire Motor Trades Alliance, Limited.

As a member of the above Alliance, I should like to reply to some of his questions.

He asks why the Alliance did not arrange for better positions for the British manufacturer at the Automobile Exhibition than their foreign competitors.

Until quite recently, the agents have formed a more powerful section of the Society of Motor Manufacturers than the British manufacturers. The agents may be interested in some British make, but until now their greater interest has been in foreign cars, so that the British manufacturers were not in a position to insist on a preference.

The British manufacturers are now becoming strong enough to insist on their rights, and if a few more people look at the question in the same way as Mr. Newton does, there is no doubt they will get them at an early date.

Yours faithfully,
J. I. THORNYCROFT.

Chiswick, Jan. 3rd.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I do not think that Mr. Chas. Newton can be connected with the motor trade, or he would not even suggest a Show for all-British motor vehicles only.

It would be the most troublesome matter imaginable to the whole industry. The Olympia Show has already entered into severe competition with the Paris one, with the result that the Continental makers—having found that the holding of the Olympia Show before Paris resulted in a very serious loss of business to the firms showing only at the latter Show—now advocate the holding of the Paris Show of 1906 in October, and it seems likely that the Olympia may also be advanced again so as to still be in front of the Paris one.

If in addition to the above competition there is also rivalry between two English Shows, both trying to be the first in the field, we may arrive at the time when the Show of, say, 1909 models, will be held in November, 1907.

There is another, and, I think, more serious point of view in the interest of British manufacturers. If British-made cars are as good as, or better than, the foreign, why take steps to prevent the foreigner competing on even terms? If on his merits the British manufacturer ousts the foreigner, his victory will be overwhelming, but, on the other hand, if it is through show or any other preferential juggling, there will be many well-informed motorists who will retain opinions of their own.

Now to speak in the interests of the buyers (public). Is their patriotism so strong that motives of self interest do not intrude, and is it not the best value, irrespective of country of origin, that is the main quest? After all, are not the interests of the trade best served by free and healthy competition?

I cannot think that a restricted Show would be welcomed either by the motor trade in general or the private users of motor vehicles.

Yours truly,
ERNEST H. ARNOTT.

Teddington, Jan. 3rd.

6 CYLINDERS v. 4 CYLINDERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I for one among British manufacturers who aspire to be among those at the top, and to see everything, where possible, produced in this country, and for its benefit, have the greatest possible pleasure in accepting Mr. S. F. Edge's sporting and unique offer to have a 6-cylinder car placed at my disposal for a day or so, I, of course, insuring it against all risks while in my possession.

I do not wish to be outdone, even by Mr. Edge, in breadth of mind and the desire to help my fellow home manufacturer, and if Mr. Edge, or any of his able staff, care to have a 6-cylinder Ariel-Simplex car placed at their disposal for a like period, it will give me the greatest possible pleasure to reciprocate the laudable desire to place the home industry on a firm and lasting basis, which must underlie your able and frequent correspondent's letter.

Yours faithfully,
CHAS. SANGSTER.

Ariel Motor Company.
Jan. 4th, 1906.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Most of your readers must, I feel sure, be getting rather tired of the aimless wanderings of your interested correspondents, who are doubtless endeavouring to grind their own axes to each other's discomfiture. As a mere struggling dealer in both four and 6-cylinder cars, I trust I may be allowed to air my views without bias, as it makes no difference to me which particular type I sell, except that the profit on cars fitted with six cylinders is rather in excess of those fitted with four. After carefully considering the claims advanced for the 6-cylinder engine, I cannot see that the advantages outweigh the increased liability to break down, and it must be admitted that on a 6-cylinder engine there are 50 per cent. more working parts to give trouble than on a 4-cylinder, and now that my old friend Charlie Rolls has produced a car fitted with sixteen valves, I look forward with some dismay to the conversation that will take place at a way-side inn between the chauffeur and his master, which will be something as follows:—

Master: "John, what is the matter with the engine?"

Chauffeur: "I am afraid it is the twenty-ninth valve which has stuck up."

This is what will happen in 1907 when we see 16-cylinder engines.

Yours faithfully,
J. E. HUTTON.

Jan. 5th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR, Your correspondent—Mr. Gladstone Colebrook—asks me for some information. I will answer it, and I hope the answer will be satisfactory to him, and that he will take the trouble and fairness to compare the measurements I give him, with 40-h.p. 4-cylinder cars, and I think he will find that the measurements of the 6-cylinder Napier are very excellent.

The 40-h.p. 6-cylinder Napier wheel-base is 9 feet 8 inches. The three pairs of cylinders take up 33 inches.

His suggestion that a 6-cylinder engine is one-third longer than a 4-cylinder one is obviously inaccurate, as I assume he wishes the comparison to be made between engines of similar horse-power. For example, four 5-inch cylinders would give say 40-h.p., six 4-inch cylinders would give at least equal horse-power. Therefore, the difference in length, so far as the cylinders are concerned, need only be 4 inches. Of course there is not the slightest necessity to get the same horse-power with the 6-cylinder engine, for it to be one-third longer than a four. Then, in regard to the proper distribution of weight, the distance from the dashboard to the centre of the front axle on the 40-h.p 6-cylinder Napier is 36 inches.

I think he will find that this is about the usual accepted position for the front axle on a similar h.p. car. It is quite useless him referring to the 6-cylinder foreign car which was shown at Olympia. Surely I must not be blamed because a foreign manufacturer has been unable to properly design a 6-cylinder car, and will your correspondent, after fairly considering the measurements I have given, make a fair and honourable retraction of his mis-statements?

Yours truly,
S. F. EDGE.

January 6th, 1906.

STICK TO THE SUBJECT—AND DROP PERSONALITIES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I notice in last week's issue of your paper a letter from Mr. Jarrott and also one from Mr. Edge. Now, the letters which have been written by these two gentlemen on the subject of 4 and 6-cylinder engines have been very interesting, but I regret very much to see that this last week they have taken a different tone altogether. They are what I may call personal attacks upon one another, and this state of things is much to be deplored, as two such good friends, both good sportsmen, should not allow personal feelings to come into their letters. By all means, Mr. Edge, write all you can in favour of the 6-cylinder engine, and if you, Mr. Jarrott, will champion the 4-cylinder, we shall all be much obliged to you, and shall look each week for the different arguments you can bring forward, but do not get on to politics or personal feelings, for the sake of your old association. Remember, I am only one of the buying and trading public, but still at the same time I know you both very well.

Yours faithfully,
"THE TRAMP."

BRITISH *versus* FOREIGN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In reference to the vexed question of British and foreign manufacture of automobiles, I have read the communications in THE AUTOMOTOR JOURNAL, and confirm my numerous public utterances to the effect that, personally, I am a firm believer in the protective tariff—say, 15 per cent. on all imported cars. This would secure to us Englighmen the standard asset of our own country's trade, which policy, bearing in mind that we are the largest buyers of automobiles, would do wonders for the British industry. On the other hand, I do not permit sentiment to enter into my business affairs, and, bearing in mind that no such tariff is in existence, and there still exists a grave doubt as to whether it ever will exist, I fail to see why, in the event of a demand arising for foreign manufactured cars, we should fail to supply them.

The importation of these vehicles is distinctly a profitable business—in fact, better for the importer (who is usually a Britisher) than the foreign manufacturer. The numerous high-class cars made in France, Germany, and Italy, should obviously receive their due share of appreciation at the hands of the British public, as do all high-class manufactures, independent of the country in which they are produced, and justly so. These machines have secured sound reputations, and when the demand is created, why should we hesitate to do the business?

In my mind an inference may be drawn from Mr. Jarrott's letter, to the effect that French cars are superior to those manufactured in this country, and although this may have been the case until recently, I certainly think that this is not so to-day. We have several firms in Great Britain producing cars in all respects equal to the French makers, and, in fact, second to none in the world. I am able to cite an instance which proves that foreign goods are not finding better favour, at any rate in the commercial line, than British-made chassis. For instance, my firm is importing heavy chassis from Germany; on the other hand, we have purchased the patents, and are manufacturing the same vehicle in this country, and although until quite recently we have been willing to supply British or German cars to order, our order sheet to-day for the British cars represents upwards of £400,000, whereas that for the foreign cars approximates only £45,000, and buyers are now, after mature experience of the British cars, specifying that their goods are to be British built. This is a significant fact which clearly shows the importance of adopting a practice whereby a correct model is employed irrespective of its original source. While I have no desire to say anything which may depreciate the importance and desire for original productions, I firmly believe the great drawback to more rapid progress in satisfactory car manufacturing in Great Britain is largely due to the fact that much time has been wasted in carrying out experiments with new schemes without previously fortifying our knowledge by ascertaining what others who possess greater experience are doing before we start to prepare drawings.

There are several British firms known to me, who until recently have been in a fairly large way of business, and their productions, I must admit, in my mind are nothing less than freak cars. These the public have bought until the last twelve months or so fairly extensively, and obviously paid the penalty. Whereas, no one can gainsay the fact that the Continental manufacturers are now only putting on the market designs proved by sound practice and long experience. Englishmen are not slow to appreciate the benefits arising out of buying cars from firms who possess works in the country, where parts are always obtainable on the spur of the moment, where inspection can be carried out at the buyer's discretion, where any defect in design or manufacture can receive prompt consideration, and where special models can be built up without loss of time, &c., &c. These are features which appeal to the commercial user extensively.

There are many in the motor trade holding the opinion that those bodies responsible for watching the trade interests should be subdivided into British and foreign. But I am one of those who consider such a policy suicidal to the best interests of the movement. The result of the last Olympia Exhibition is certainly a conclusive proof of what can be attained by unanimous action, and both British and foreign makers and traders may congratulate themselves upon the splendid manner in which they supported the Society of Motor Manufacturers and Traders over this Show. The large increase in trade, and other benefits, which have been derived, due to the united front displayed by the trade, are, to my knowledge, very considerable, and will be felt still more in the coming year.

To conclude, the progress of the British industry must, in my opinion, advance with the development of the movement. That the British industry will prove pre-eminent, is obvious, but this is a question of time. "Slating" the foreigner does not lend dignity to our posision, neither is it consistent with our best interests, as without him the public sympathy in automobilism would never have been attracted to the extent it has been, and, after all, that is the main goal to which we are all working.

It appears to me that, until a tariff is fixed, there is no commercial inducement for the prospective purchaser to favour the British manufacturer. Ardent patriotism is essentially a desirable feature in the politician, but I consider it an unnecessary quality in the motor manufacturer.

Yours truly,
SIDNEY STRAKER.
SIDNEY STRAKER AND SQUIRE, LIMITED.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—My attention has been called to Mr. Chas. Jarrott's letter and the extraordinary conclusions he comes to. I join issue with your correspondent on his first material statement, which is, if foreign cars had been taxed in the past, the motor industy in this country would have been, and would be now, considerably retarded. On the contrary, if we had had the commonsense to substitute for some aimless tax a duty on foreign cars, and giving Mr. Jarrott, for the moment, all he can possibly claim by tentatively agreeing that we should have paid all the tax ourselves to ourselves, the position to-day would be that instead of exporting three millions, or thereabouts, in gold, and importing three millions in cars, we should have in this country the gold and the cars, and at no cost to ourselves—if the duty had been large enough to make it unprofitable for the foreigner to import cars which can be made quite as well in this country by its workers.

It has never been suggested by any responsible tariff reformer that we should pay more in taxation than even the most rabid misnamed free trader has to admit we already pay to-day.

If the totally unthought out, and even stupid tax on tea (which we can never make in this country, and which in no sense of the word is a luxury) had been removed and applied elsewhere, to motor cars for instance, with a well thought-out object, the majority of alien cars at present made in foreign countries for their benefit would have been begun to be manufactured in this country long since.

I doubt if there are any foreign makers of repute who have got it under contemplation to commence manufacture in this country directly our fiscal system is put into line with all the other highly intellectual and highly civilised nations of the world. One instance, perhaps, will suffice.

I am in a position to state that if a tax had been imposed which would handicap the foreign maker against the home maker, the famous firm of Panhard and Levassor would have taken works adjacent to here, and manufactured their cars for this market, in this country. I do not know for certain the amount of the sales of Panhard cars here in a twelvemonth, but I do know that it is many hundred thousands of pounds. At the present time we have the very excellent cars. France, and the firm named, have our not excellent money. I say that, admitting for the sake of simplifying the argument, that we paid the whole of the tax, it was, and is possible, without paying one penny more in total taxes, to have both the cars and the money for this country. As far as this village is concerned, £2,000 per week at least would be being paid in wages, that money would be filtering through every nook and cranny of our social fabric, would be benefiting every man, woman, and child in this parish and far beyond it. I maintain that we should not pay the tax, but nevertheless, I say that it is quite unimportant if we do, seeing that we pay it to ourselves. I know that, rather than be beaten out of this important market where their vested interests are now so very large, the foreigner will pay every red cent of the tax, until such time as we adopt his deliberate real high tariff with the set intent of having nothing manufactured outside his country which can be manufactured inside it for its benefit.

Will Mr. Jarrott deny that a suitable tax could not have compelled us to have large motor factories scattered all over this country, under foreign control and supervision if he likes, and if he admits the possibility, will he dare to repeat his broad dictum that the motor industry in this country would have been, and would be now, considerably retarded? No, this is not what Mr. Jarrott means. He has accused in his letter some unknown to me contributor or speaker of want of good faith by suppression of material facts. No, that is not what your correspondent means, when he pens words to conceal his thoughts. He means that the occupation of gentlemen, such as he, sitting in an office and engaged in the exploitation and importation of foreign cars would have been considerably retarded!

It probably is a fact that the attacked speaker, instead of erecting his own factories, had induced the enterprising foreigners to build their own factories, &c. But why? because the scientific tariff imposed by every intelligent nation throughout the world, without exception, gives this British maker of motor cars not the faintest chance of building cars in this country for exportation to abroad.

If by retaliation or "a blow for a blow," instead of maudlin sentiment of "turning the other cheek," we compel the foreigner to abate his duties or else take the consequences in the shape of a depleted purse, then there would be no necessity to make arrangements for well-known brands of British cars to be manufactured inside the market they are intended for.

If cars could be imported into foreign countries as freely as they can be imported here, your readers can rest assured that no such arrangement as that indicated would ever be made. We British makers would leave agreements with the foreigners alone, and have our own brands of goods made by our own people.

Your correspondent is kind enough to admit that three well-known home motor car manufacturers exhibited at the Paris Salon, not for the purpose of selling cars in France, but to increase their status at home, forsooth, a sort of "Charge of the Light Brigade"—magnificent, but not commerce. Never mind how many cars they have delivered in France for use in that country, I ask them to deny my assertion that the net profit to date they have made out of selling cars in France would not pay Mr. Jarrott's rent for a week! Is it not possible that the Italian firms went to the Paris Salon for the same reason, to give them a standing in their own country and to meet patriotic Englishmen engaged in the exploitation of foreign cars and the writing of letters to the newspapers for the maintenance of their livelihood?

Your contributor states a large number of German cars are sold in France in every year. I deny *in toto*; it is an absolutely misleading statement, and is not due to ignorance. There are no German cars sold in France except one famous make, and the majority of those cars are sold to Americans in Paris. There is neither a large nor a ready sale in America for foreign cars, and the number of cars on which forty-five per cent. duty is paid is very small. Mr. Jarrott "carefully omits" to state that it is highly important, from the American's point of view, to always use his car a certain number of months in Europe so as to get a very large abatement on the heavy duty if he takes it into his own country. As the American tariff has been drawn attention to, perhaps it will be explained to us how it is that in poor protected America, with bad roads or no roads at all, there are at least ten times as many cars made as here. Greater population alone cannot account for it.

Allow me to anticipate Mr. Jarrott on one point. The duty on British cars into France is purposely not very heavy—about £20 each—because the French people have nothing to fear from us just now, but directly they have, then the duty will go up until the balance is restored in the eyes of this, the most intellectual nation in the world.

On cycles, however, the duty comes to nearly 30*s.* each. At the Paris Salon twelve months ago, I negotiated with one of the best known houses in France, whose name is a household word, for the supply of 5,000 bicycles to be made in Birmingham.

Careful calculations were gone into, and it was found that owing to the French makers devoting greater attention to car construction, and, therefore, to an extent, losing their grip on the cycle trade, that we, in this case the foreigner, could just pay the duty to the Frenchman and compete (it is just as well to have this proposed transaction clearly in ones mind, the Frenchman was to get as good a bicycle as at present, and for the same price, and we were to pay him 30*s.* each bicycle for the privilege of supplying it). But the negotiations fell through, and for one reason only. The French firm said, "It is the deliberate intention of our Government not to have anything manufactured abroad which can be made equally well in France. The present duty is 30*s.*, but directly we begin to import large numbers of cycles, our cycle workers will draw the attention of the Chamber to the fact, and the duty will be increased to 40*s.*, to 60*s.*, to 120*s.* each, or any such sum as may be necessary to put you out of the market. It is no use for us to attempt to establish a business which cannot last. I do not think that the French nation will have one policy in regard to cycles, and another policy with regard to motor cars.

The great authority, Mr. Charles Jarrott, came back from the Paris Salon two years ago, and went out of his way to write to the papers warning the British makers against being copyists by using honeycomb radiators, channel steel frames (chassis *embouti*), and mechanical valves. I challenged his statement, and time has shown that every car of repute, including those for which Mr. Jarrott is agent, have embodied in them, without exception, the three points I wrote should be adopted by every British maker, despite the advice given to the contrary. In this case Mr. Jarrott has proved a poor prophet. I now give him an opportunity for retaliation by indulging in a little prophecy myself. I say that if the present 45 per cent. duty into America is maintained, that in three years from now there will be no French or German new cars whatever sent into that country.— Yours faithfully,

Birmingham, CHAS. SANGSTER.
Jan. 6th.

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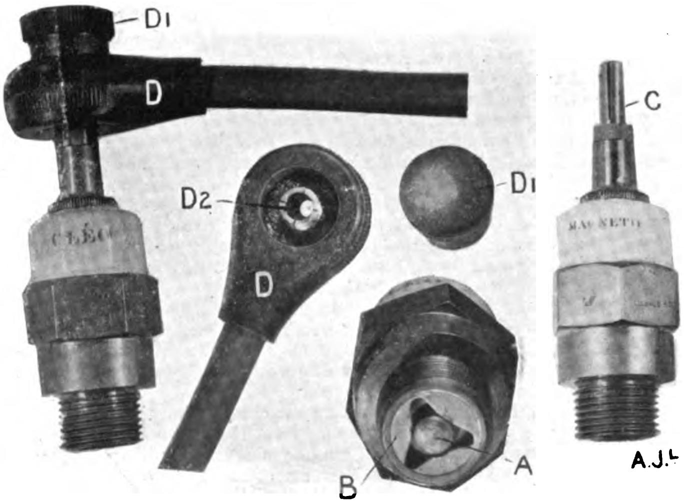
THE LACOSTE OLEO-MAGNETO PLUG.



ALTHOUGH it is not essential to use a special ignition-plug with high-tension magnetos, yet it is not every ordinary make which is really suitable for such work. Some firms are, therefore, constructing plugs embodying the features which they consider most desirable in this connection, and among such are the makers of the well-known Oleo plug. This has been placed on the market as the "Oleo-magneto" plug, but Messrs. Lacoste have added an improvement of their own, and are now marketing the complete device which we illustrate herewith.

The plug itself is of exceedingly substantial construction, and its most important point is the solidity of the sparking terminals, A and B, which provide three alternative gaps. This is done in order to enable the spark to vary its path, and, in consequence, to prevent the too rapid burning away of the points.

Messrs. Lacoste's contribution to the design consists of the very neat terminal provided for attaching the wire. Instead of the ordinary screw terminal, a split spigot, C, is fitted to the top of the plug, and this retains the detachable terminal, D, by friction only. The terminal, D, is formed of ebonite and brass, and it has a brass-lined screw-cap, D^1, which presses down on the end of the wire, thus ensuring a good contact. In the illustration the method of attaching the wire itself is clearly indicated. When required, the spigot, C, can be removed, and the ordinary screw terminal reinserted.

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The "Thery" Car.

THÉRY, the famous racing driver, is to take charge of a new establishment in France, where cars, to be associated with his name, are to be manufactured. Messrs. Mann and Overton, Limited, will be the sole agents in England for this "Gordon-Bennett" Car.

IMPORTS AND EXPORTS.—Complete Table of Imports and Exports of Automobiles to and from Great Britain.

Prior to 1900, motor cars and motor cycles were merely included in the Board of Trade Returns under a general heading of "goods, unenumerated, manufactured," and during the years 1900 and 1901 they figured only amongst "carriages, wagonettes, carts, &c. In 1902 and 1903 motor cars and motor cycles were separated from the general heading, but were even then taken in one total together. It was only in 1904 that separate returns for motor cars and motor cycles, and their respective parts, were issued by the Board of Trade under special headings. We have from month to month published these, but in view of the recent prominence given to this important subject, we have brought the whole of the figures, since 1902, together in one table. We refer to these figures editorially.

	Imports.			Exports.			Foreign and Colonial Re-exportation.		
	No. of Cars and Motor Cycles and Value.*		Parts Value.	No. of Cars and Motor Cycles and Value *		Parts Value.	No. of Cars and Motor Cycles and Value.*		Parts Value.
1902		£	£		£	£		£	£
Total	3,747	992,229	110,836	415	155,340	16,803	183	52,714	5,161
1903.		£	£		£	£		£	£
January	540	152,970	14,142	62	14,955	1,921	14	3,743	290
February	300	82,542	12,193	53	24,205	2,024	12	5,937	717
March	571	170,888	35,408	54	15,303	3,799	15	7,370	2,120
April	588	138,566	15,389	50	21,830	3,672	29	7,159	1,123
May	570	160,729	23,316	51	15,515	7,301	30	7,815	826
June	747	233,742	25,109	60	18,372	3,782	18	4,274	304
July	722	210,518	25,429	59	27,553	5,589	65	36,102	1,396
August	612	159,202	37,162	111	31,212	3,859	31	14,067	1,463
September... ...	461	141,335	18,944	121	29,158	4,708	36	9,901	1,630
October	303	98,570	21,495	100	24,299	3,335	45	12,529	2,460
November... ...	479	101,357	22,623	91	22,545	4,160	28	5,708	1,629
December... ...	241	63,747	23,335	143	40,722	13,996	59	12,054	2,291
Total	6,134	1,714,166	274,387	955	285,669	58,148	382	126,659	16,249

	Imports.						Exports.						Foreign and Colonial Re-exportation.					
	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.	No. of Cars and Value.		Parts Value.	No. of Cycles and Value.		Parts Value.
1904.		£	£		£	£		£	£		£	£		£	£		£	£
January ...	335	102,866	17,906	51	1,528	2,218	55	25,168	3,470	78	3,000	619	35	9,223	1,011	7	249	226
February ...	538	185,499	21,496	87	2,971	1,983	65	23,913	4,280	73	3,147	234	43	18,854	1,186	11	320	45
March ...	492	169,166	20,741	178	5,774	1,818	55	24,064	5,221	49	1,787	516	43	19,756	3,230	3	98	78
April ..	559	170,757	31,742	141	4,498	1,891	42	15,119	5,272	65	2,249	668	37	13 859	4,057	17	549	208
May ...	530	224,129	28,216	121	3,964	2,001	30	10,954	6,169	56	2,146	423	21	10,062	2,061	5	218	100
June... ..	581	248,579	46,733	122	3,240	1,424	27	7,485	8,815	66	2,931	506	31	16,354	2,062	5	150	30
July	633	251,472	26,656	70	2,226	429	48	16,812	4,723	43	1,859	713	30	11,986	1,729	8	346	46
August ..	594	243,729	44,139	69	2,240	781	53	15,760	8,798	58	2,594	325	39	20,878	3,513	2	50	142
September ...	386	169,472	33,863	8	536	1,273	71	25,246	6,503	64	2,608	464	31	11,221	3 048	19	433	—
October ...	282	117,296	22,521	34	1,027	1,112	67	15,806	6,469	72	3 052	578	35	13,604	1,898	4	140	29
November ...	237	99,518	28,871	94	2,772	1,447	96	30,161	9,876	73	3,288	1,319	36	12,821	1,392	3	105	71
December ...	211	97,888	20,685	4	79	495	94	31,220	10,662	74	2,456	929	25	9,639	2,336	3	91	241
Total ...	5.378	2,080,371	343,569	979	30,855	16,872	703	241,708	80,258	771	31,117	7,294	406	168,257	27,523	87	2,749	1,216
1905.		£	£		£	£		£	£		£	£		£	£		£	£
January ..	362	149,578	36,608	57	1,842	905	77	25,590	7,480	58	2,026	673	50	19,006	2,733	8	214	138
February ..	431	195,978	56,773	102	3,748	1,957	62	20,209	6,335	63	2,389	1,003	79	39,772	4,532	2	54	52
March ...	560	239,091	75,463	152	5,369	2,721	49	14,749	7,862	46	1,471	1,024	36	20,783	3,440	14	290	55
April ..	544	225,012	68,891	192	6,477	2,087	55	16,590	9,635	46	1,459	608	38	19,697	7,885	8	369	59
May... ..	728	327,008	77,801	280	8,274	2,947	55	15,670	10,014	60	2,181	1,803	17	8,572	3,270	1	60	40
June... ...	557	259,359	53,362	211	6,581	2,201	59	16,797	13,239	83	2,286	1,293	20	11,491	2,815	17	512	109
July	675	277,738	71,968	212	6,931	2,178	59	23,295	8,314	52	1,791	1,000	50	15,419	2,479	6	177	61
August ..	505	230,568	96,084	116	3,912	1,101	88	33,239	10,929	64	2,177	1,266	75	40,362	5,299	3	105	123
September ...	399	160,318	96,651	73	2,586	457	129	47,110	6,507	52	1,796	1,304	58	29,686	2,169	2	110	80
October ...	259	105,182	83,745	92	2,911	2,026	157	57.793	8,290	41	1,543	1,258	68	26,001	4,045	24	698	44
November ...	359	174,470	100,730	101	3,507	2,237	173	60,434	16,127	55	1,922	2,019	51	17,529	3,383	7	209	278
December ...	243	93,700	111 045	112	3,650	3,238	116	45,377	21,129	75	2,826	4,196	70	37,209	11,537	8	391	474
Total ..	5,622	2,438,002	929,121	1,700	55,788	24,055	1,079	376,853	125,861	695	23,867	17,447	612	285,527	53,587	100	3,189	1,513

* Not divided until 1904.

RACES, RECORDS, AND TRIALS.

Melbourne-Sydney Reliability Contest.

LAST week we concluded our account of this "overland" trial in Australia, by giving a list of the five competitors who were still "running" with a margin of marks to lose. Hobbs and his Mercedes was the only competitor who still had an absolutely full score of marks, which might lead to the supposition that under the circumstances the Dunlop Cup would go to him. Under the rule, however, all those who tied over the Melbourne to Sydney course, were started on their further runs, as enumerated by us last week, with ten points each to lose for engine stops, &c., and so long as any competitor had one of these 10 marks left, he was considered as co-equal with the other "ties" still running. As the cars had every appearance of being capable of continuing the tests until further notice, an awkward position was presented. The Dunlop Rubber Company, who had organised the trial, therefore decided not to continue the run, considering that the contest had served its purpose by the return run to Melbourne. The promoters, therefore, with the consent of the competitors, made the following arrangement :—The "Dunlop Cup" to be inscribed with the names and performances of the five contestants, and the Automobile Club of Victoria to be asked to hold the Cup on their behalf for the next twelve months. In the event of one of the five contestants winning the Cup next year the trophy to become his own property. Mr. G. Hobbs, in recognition of his fine performance, to be presented with the Motoring Road Blue Ribbon of Australia and gold medal, together with the Bailleau Trophy; Messrs. W. R. Grimwade, W. B. Wilkinson, and H. Tarrant to each receive a Dunlop Trophy, of similar design and value, together with gold medals; Mr. S. Day to receive the Robert Hurst Trophy and gold medal.

T. K. Rand in trouble on Razorback Mountain with its 1 in 6 grade.

C. E. Liddel's Panhard Car surmounting Razorback Mountain.

MELBOURNE-SYDNEY RELIABILITY TRIALS.

And thus endeth the second memorable contest for the splendid trophy presented by the Dunlop Company.

Last week we gave a number of interesting pictures of the event, and this week we are enabled to supplement these by a series of striking photographs, including some of the "run off" between the full mark cars for the Dunlop Cup. The five competitors and their cars, who will now hold this Cup jointly, are shown in our frontispiece.

In our table of results, published on page 8 of our last issue, the names of the cars driven by Messrs. Wilkinson and Grimwade were, by a slip, transposed, although in the text it will be seen the right cars were attributed to each. Mr. Wilkinson drove the 10–12-h.p. Talbot car, which made best time in its class—B—and Mr. Grimwade drove the 10-h.p. Argyll.

French Motor Grand Prix.

OF the large number of circuits proposed for the French race of this year, the "Circuit de la Brie" is receiving very favourable consideration at the hands of the French Club. In fact, out of about 10 circuits which are regarded as having any chance of selection, the Brie course is placed as even; Seine-Inferieure (Dieppe), 4 to 1 against; Fontainebleau, 6 to 1; Argonne, 10 to 1; Calvados, 20 to 1; Auvergne, 25 to 1; Aix-les-Bains, 50 to 1; Mans (S. et O.), 100 to 1; and La Loire, Nivernais, and Mayenne, 150 to 1 against each. The Brie circuit proposed is a triangle of about 110 kiloms. from Melun to Montereau, *viâ* Sivry; from there to Provins, *viâ* Donnemarie and Longueville, and thence back to Melun *viâ* Maison Rouge. An alternative route differing in detail is also proposed. There a *possibility* that the race may extend over two days!

A fine stretch of road on the "run-off" from Sydney to the Blue Mountains and back. G. Hobbs making good time on his Mercedes.

Coming down the Blue Mountains, N.S.W., on the "run-off" for the Dunlop Cup. The leading car is W. B. Wilkinson's 10–12-h.p. Talbot, the car in the distance being A. Fauvel's 12-h.p. Richard-Brasier.

MELBOURNE-SYDNEY RELIABILITY TRIALS.

Resilient Wheel Trials.

Broadly, the basis for the rules governing the proposed resilient wheel trials in France, being organised by *L'Auto*, has been agreed. The date is to be between March 15th and April 15th; cars, upon which any device is fitted, must weigh, fully laden, at least 1,500 kilogs.; the distance is to be about 3,000 kiloms. in 10 stages, at an average speed of 30 kiloms. per hour; maximum piston displacement, 3½ litres; drivers may be changed; repairs must be made by those in the cars; observers will report performances, and closed "parcs" are to be enforced.

The trials will not take place this year, in the event of the proposed pneumatic tyre trials of the A.C. de France being held—a contingency which is thought to be unlikely.

An Ideal Abandoned.

The Automobile Club of Germany have withdrawn for 1906 their suggestion that the European clubs should agree to hold one big international contest only during the year. They propose, however, to revive this suggestion for later years.

Crystal Palace Motor Show.

This Exhibition opens on the 26th inst., closing February 3rd. A new feature will be the use of one of the lakes for motor boat trials.

Contest of Public Vehicles.

The full title of the company which secured a silver-gilt medal in the contest for public vehicles for town use, recently held in Paris, and of which we gave a report on December 30th, is "Compagnie de Française des Voitures Electromobiles."

MELBOURNE-SYDNEY RELIABILITY TRIALS.—A few of the competitors indulging in an al fresco afternoon tea at Strathfield Control, Sydney.

The Next Tourist Trophy Race.

THE secretary of the A.C.G.B.I., last week, went over to the Isle of Man in connection with the arrangements for holding the Tourist Trophy Race in the island this year—possibly in May.

Middleton Hub Long Distance Test.

THE report of the Automobile Club has now been issued of the 4,000 miles long distance trial from November 21st to December 22nd, under ordinary touring conditions, to which the Middleton Pneumatic Hub, described by us fully recently, has been subjected under the supervision of the Club officials. From this it will be gathered that the trial has resulted in an extremely satisfactory performance. Subsequent to the trial a further short run was made by Col. Holden and Mr. Worby Beaumont. The wheels were then removed, taken to pieces and examined by them for wear and condition. The following is the official report in regard to the whole trial:—

The side plates and connecting driving studs were in good order, the wear of the faces being practically nil. The studs were not worn, but the rubber sheathing which had been put upon them had been ground to powder.

The pneumatic tube supporting discs showed no wear.

The nuts on the ends of the connecting driving studs were screwed down on to the side plates with intervening Thackeray spring washers, which seem to have retained the nuts quite satisfactorily.

Of the pneumatic tubes, three were replaced during the trial, and one lasted throughout the trial; its condition justifies the expectation that its mileage might have been considerably extended before failure. Of the three tubes which failed, one had been run 6¼ miles deflated (on the 1st December, 1905) and was then replaced. This tube does not appear to have been worn through, and at the time of the examination still held air put into it after removal. The main body of the material of the tube was, however, separated in a circular mid-section line, except as to the interior rubber lining, and this was apparently due to mechanical pressure in the working of the wheel. In other respects this tube might be roughly described as half worn out. The other two tubes, whose failure is reported, failed from what may be termed disintegration, resulting from the combined effects of internal pressure, the bearing upon the edges of the inner supporting discs, the relative motion of the wheel ring and hub plates, and the alternating compression and release of the vertical walls of the tube as the wheel rotates under load.

The fact that a wheel may be run with a deflated tube is one of interest to the user, especially as it appears that the tube is not damaged by running a few miles in that condition, and that the fact that it is deflated is not readily detected by those riding in the car. This points to the importance of the part played by the solid rubber tyre in connection with this device, and leads to the suggestion that the true way to test the efficacy of the pneumatic hub would be to try it in conjunction with iron tyres.

The condition of the solid rubber tyres used in the trial was noticed, but does not call for remark with regard to the pneumatic hub.

The diameter of the wheels over the tyres was 34 ins., and the weight of the wheels was as follows:—Back wheels with sprocket, 185 lb.; front wheels, 176 lb.

The trial may, as a consequence of the bad condition of the roads, be considered to have been unusually severe, both for the pneumatic hubs and the car, a 16-20-h.p. Florentia, the running of which throughout the trial will be seen to have been consistently reliable.

Number of Miles Run per Wheel, without Involuntary Stops.

Near Front.	Near Rear.	Off Front.	Off Rear.
1143	2054¾	899¾	899¾
246	1343¾	13	—
—	99	—	—
2616	507½	3092¼	3105¼ End of trial.
4005	4005	4005	4005

Petrol Consumption.

287 gallons 3 quarts: 13·9183 m.p.g.

Circuit Européen.

A MEETING of the International Clubs taking part in this big trial is announced to be held on the 20th inst. at Berlin.

On page 1538 of our last volume we published a table giving the leading particulars of the regulations governing each of the four categories into which this event is to be divided. These classes, it will be remembered, are governed by piston *area*, but unfortunately an error crept into that table, mm.^{3} appearing instead of mm^2., and the decimal point being shifted one place so that the figures were given ten times their real value. This obvious slip can hardly have caused any real inconvenience, since actual dimensions were also given in the same column, but we take this opportunity of repeating the maximum total piston areas (in square millimetres) for each class, which are as follows:—Cat. I. 8,659 mm.^{2}; Cat. II. 22,619 mm.^{2}; Cat. III. 34,636 mm.^{2}; Cat. IV. 53,092 mm.^{2}.

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MOTOR BOATING.

Mediterranean Cup.

IT has been decided that the running of this race in 1906 shall be abandoned, the next contest being fixed for 1907.

Coupe de la Riviera.

IN April, this Cup is to be contested, a start being made on April 17th from Nice for Toulon. On April 19th, the return journey will be made to Nice, with a stop at Cannes, to enable competitors to take part in the Burton Cup Race on that day. The next journey, on April 20th, will be to Genoa, and on April 22nd the return to Nice takes place.

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MOTOR CYCLING.

Auto Cycle Club's Annual Dinner.

MEMBERS are again reminded that the annual dinner of the club will take place on Wednesday next, January 17th, at the Criterion Restaurant, Piccadilly Circus, W., at 7 for 7.30 p.m. The chair will be taken by Mr. Robert Todd, who will be supported by Earl Russell, Sir Martin Conway, Col. H. C. L. Holden, and others. Several well-known motorists have unfortunately been prevented from attending owing to the general election; the tickets are, however, going off well, and there is every prospect of the dinner being a great success. An attractive musical programme is promised between the speeches.

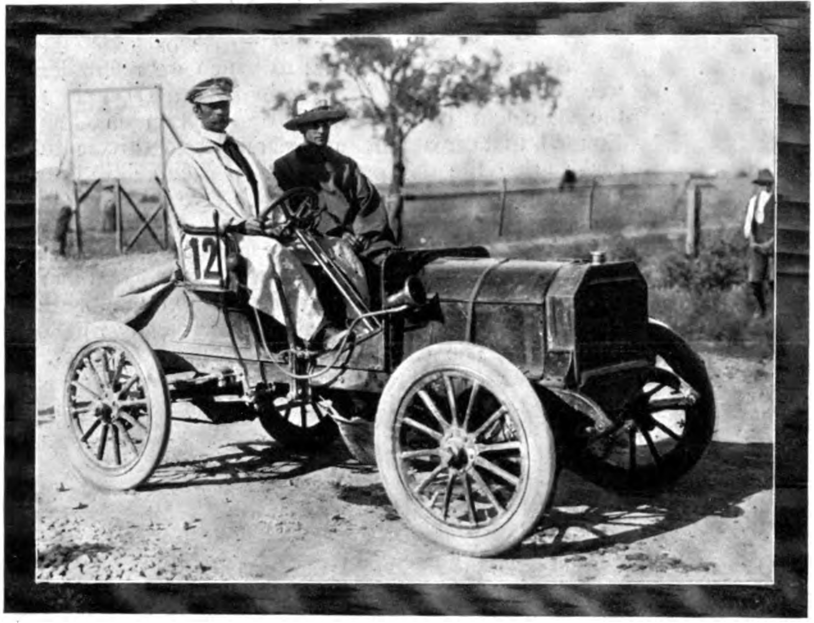
Those members who have not already booked seats should do so without further delay on the form which has already been sent out.

Quarterly Trials.

ENTRIES close on Monday next, January 15th, for the First Quarterly Trial of the Auto Cycle Club, which is to take place on Saturday, January 20th, starting from the Chequers Hotel, Uxbridge, at 9 a.m. The route will be *viâ* Beaconsfield, High Wycombe, Dashwood Hill, Wheatley, Islip to Banbury, returning *viâ* Bicester, Aylesbury, Berkhamsted, Chesham, Amersham, and Beaconsfield to Uxbridge. We would remind our readers that the entrance fee is one guinea to manufacturers or agents. Private owners, who are not interested either directly or indirectly in the machine which they are riding, and which must be their own property, can enter for half-a-guinea.

International Cup for Motor Cycles.

THE eliminating trial for the selection of three machines to represent Great Britain in the race this year, will be held, probably, in May, in the Isle of Man.



MELBOURNE-SYDNEY RELIABILITY TRIALS.—H. Tarrant on his 8-10-h.p. Tarrant Car with which he tied with four others for the Dunlop Cup, after driving 1,276 miles. This car, it will be remembered, is an Australian car, built in Melbourne.

The Endorsement Absurdity Again.

A CRASS example of the absurdity of the Act which necessitates the endorsement of the holder's licence if convicted of no matter how trivial an offence, was afforded last week at Lowestoft. Mr. Mawdsley Brooke was driving through the town on the evening of the 17th of December, when one of his lights went out owing to a leakage of oil. The Bench proceeded to fine him 10*s.* and costs, when to the surprise of the "Court" it was pointed out by the clerk that in that case his licence must be endorsed. After considering the matter and finding that such was really the preposterous law on the subject, the Bench revised their decision, as Mr. Brooke's licence had never been endorsed before, and refused to convict, ordering him merely to pay the costs amounting to 5*s.* 6*d.*

Motor Funerals.

THE automobile hearse is an institution which we knew was certain to come sooner or later. We remember some years ago a funeral in a prominent Midland town in which all the vehicles forming the procession were self-propelled excepting the principal one, but now this difficulty has been got over in Paris, and funerals which are automobile from the hearse to the last mourning coach are to become a regular phenomenon. The difficulty hitherto has been to secure a sufficiently slow and sedate pace, but that we believe has now been surmounted. On the return homeward after the ceremony a higher gear is usually employed. Messrs. De Dion exhibited a motor hearse among their commercial vehicles at the Paris Salon, although, in order not to damp the ardour of business enquirers, it was not given undue prominence.

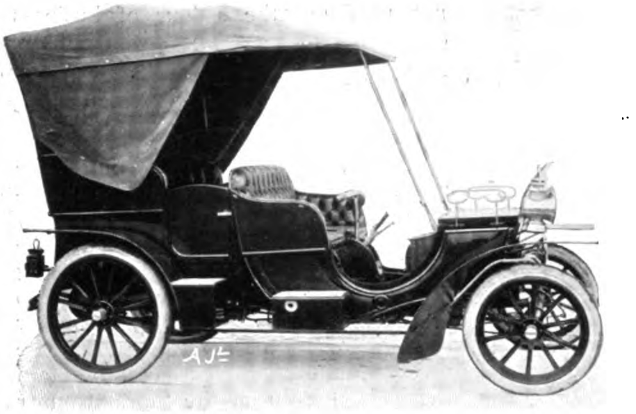
The Pushfulness of Surrey "Bumbles."

THAT the authorities of Surrey are not deficient in—well, let us be charitable and call it assurance—is shown by a letter which has been written by the Clerk of the County Council, requesting all persons resident therein who have to take out licences for carriages, motor cars, motor bicycles, dogs, guns, male servants, and other kickshaws, to obtain these licences from the Surrey County authorities, so that the said Surrey County authorities may benefit from the funds that thereby accrue. Considering the systematic persecution to which motorists have been subjected in the county, we trust that most residents, particularly automobilists who have to take out or renew licences during the coming year for any of the above luxuries, will apply, even at inconvenience to themselves, in some county where motorists are treated with more consideration.

Tragic Coincidence.

ONE of those coincidences which almost appear to have something of the supernatural about them, occurred at Markyate, the village in Hertfordshire where last summer a small boy was run over and killed by a car under painful circumstances. The King's motor cars were passing through the same village on Tuesday last when a puff of wind blew away the cap of Mr. Barnes, one of the servants, as he was engaged in putting it on. He made a snatch at it, and was thrown violently from the car, sustaining a fatal fracture of the skull.

MELBOURNE-SYDNEY RELIABILITY TRIALS.—Last week we gave a picture of S. H. Day's 8-h.p. De Dion, one of the cars which tied for the Dunlop Cup. The above view shows very plainly the broken front springs of the car, in which state this car was driven for the last 500 miles of the trial. The car was a three-year-old single cylinder vehicle.



The first of the new 1906 models of the 15–18-h.p. British Duryea Cars.

CLUBS AND ASSOCIATIONS.

Aero Club.

AMONGST the new members elected to the Club at the meeting held last week were :—The Hon. Mrs. Burrell, Admiral Sir Charles Campbell, K.C.M.G., Lord Llangattock. Mr. Lionel de Rothschild, Mr. A. J. Orr Ewing, Monsieur Paul Tissandier, son of the celebrated French astronomer ; Count d'Oultremont, President of the Belgium Aero Club ; Count de la Vaulx, Vice-President of the Aero Club de France ; and Monsieur Jacques Faure, who went from London to Paris by balloon, and recently won the Aeronautical "Grand Prix" by travelling from Paris to the borders of Russia, a distance of 800 miles in 18 hours.

British Empire Motor Trades Alliance, Limited.

THE following firms have been elected to :—

Membership: Adams Manufacturing Company, Limited, Austin Motor Company, Limited, D. Napier and Son, C. S. Rolls and Co.

Associate Membership: Sirdar Rubber Company, Limited.

Committee: Austin Motor Company, Limited, D. Napier and Son, C. S. Rolls and Co., Wolseley Tool and Motor Company, Limited.

Northamptonshire A.C.

A MEETING of the Committee of the Club was held last week or the purpose of electing a president, vice-presidents, other officers, and members, also to adjust rules, and to complete the organisation of the club. Sir Thos. Hesketh, Bart., was in the chair. The following were elected :—

President.—The Right Hon. Lord Lilford.

Vice-Presidents.—Sir Thos. Hesketh, Bart., Major G. E. T. Hibbert, Mr. Harry Manfield, J.P., Lieut.-Col. A. F. Mulliner, V.D.

Committee.—Messrs. C. W. Bartholomew, F. Gorrell Barnes, Humphrey Bennett, Frederick Bostock, Capt. W. Briggs, Messrs. A. H. Bryan, Leslie W. Dryland, Col. C. E. Foster, Messrs. Henry Hawkins, W. A. Henshaw, Thos. Horton, J.P., A. A. Hope, G. H. Lewis, Chas. W. Phipps, Rev. W. Seggins Pratt, Rev. M. Pitchford, Major Leslie Renton, Captain Sowerby, Mr. W. M. Wroughton, M.F.H., Councillor S. Yarde.

Mr. Sidney F. Harris, Weston Favell, Northampton, was elected Honorary Secretary of the Club, and all communications appertaining thereto should be addressed to him at his office, 1, Sheep Street, Northampton. The election of the other officers of the club was held over for another meeting.

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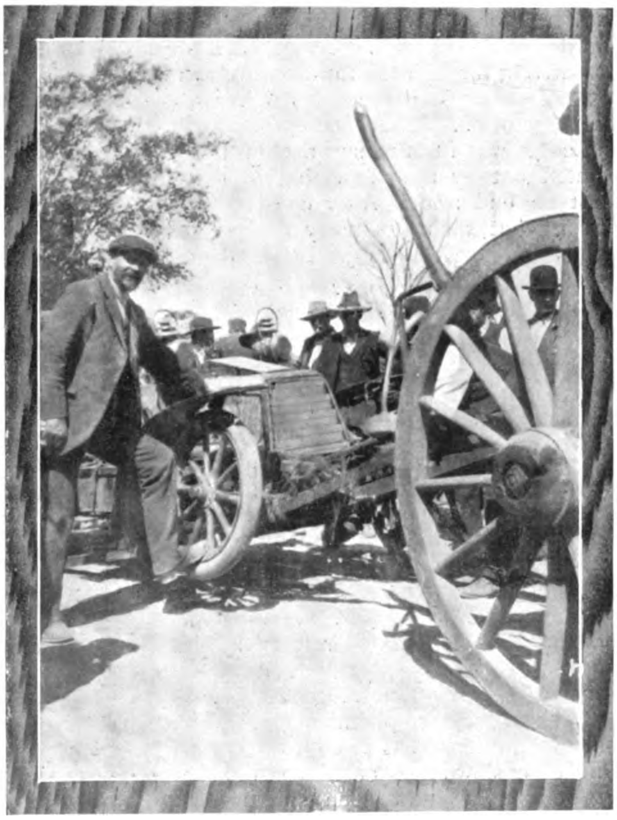
A Useful Companion.

A VERY useful and compact pocket measure, which embodies comparative measurements for practically all everyday purposes, is to hand from Mr. J. M. MacLulich, managing director of the Sirdar Rubber Company. This little memento is a pleasant accompaniment to Mr. MacLulich's New Year's greetings.

Fine for Renewing a Driving Licence: Non-use of your Car for one (or more) Days.

APROPOS of the subject to which we referred last week, the renewing of licences by local authorities, and the statement by the official of the London County Council, that car owners must refrain from driving their cars during the day or two that is occupied in the renewal of their licences, we would observe that the situation certainly appears to be far from satisfactory or even sensible. It may appear to the registering officials no hardship that car owners should be deprived of the use of their cars for that length of time, as presumably they employ them mainly, if not always, for merely frivolous purposes. The case of a business man, however, to whom the car is a requisite for obtaining his livelihood, or carrying on his business, seems to have been neglected altogether. The Clerk of the County Council makes a great merit of having in some cases returned the driving licences on the same day that the renewal was applied for. Why there should be any delay is certainly something of a mystery. Season ticket holders on railways are in the habit of walking into the office when they renew their tickets, and having the new tickets issued to them while they stand at the counter, the total time occupied being seldom more than about ten minutes. Why our public authorities should be incapable of equal despatch is one of those many mysteries of British organisation which will presumably furnish food for discussion to archæologists and other students of quaint customs in the dim and distant future.



MELBOURNE-SYDNEY RELIABILITY TRIALS.—
The above picture is not a representation of a new machine-gun in limber. It is D. Mackenzie's 12-h.p. Darracq Car being assisted after its trouble with a broken front axle at Euroa.

"Direct-Drive" Monopoly in France.

IT appears that the majority of automobile manufacturers in France have now arrived at a compromise with the Renault firm, and have agreed to pay a small royalty on all live-axle, direct-drive cars sold by them on and after January 1st last. This arrangement cannot, of course, in any way affect the validity or the scope of the corresponding English patent, concerning which we have already given full particulars in these columns.

Motor Cars and the General Election.

THE importance of motor cars to the coming election is being recognised by manufacturers generally, and the Wolseley Company are bringing out special machines designed particularly for standing the rough work to which they are likely to be exposed, provided with suitable bodies for the purpose, and put on the market at a comparatively low figure. To what extent candidates or organisations will be prepared to go to the expense of buying cars for electioneering purposes only is, of course, a question, and no doubt can be entertained as to the enormous value of a good supply of vehicles on polling day, and before it, to any candidate who has to fight a closely contested election. It will be remembered that the hiring of vehicles, that are either regularly let out for hire or kept for that purpose, is distinctly illegal under the Corrupt Practices Act, and that any candidate who either himself, or through his agent, employs them, or whose friends hire such vehicles for his assistance to take electors to the poll, is likely to be unseated on petition. In any case those cars might be provided with cheap and strong bodies of the workshop order, though, perhaps, a little more externally attractive, and when the stress of the election is over they could be fitted with more luxurious bodies for regular use.

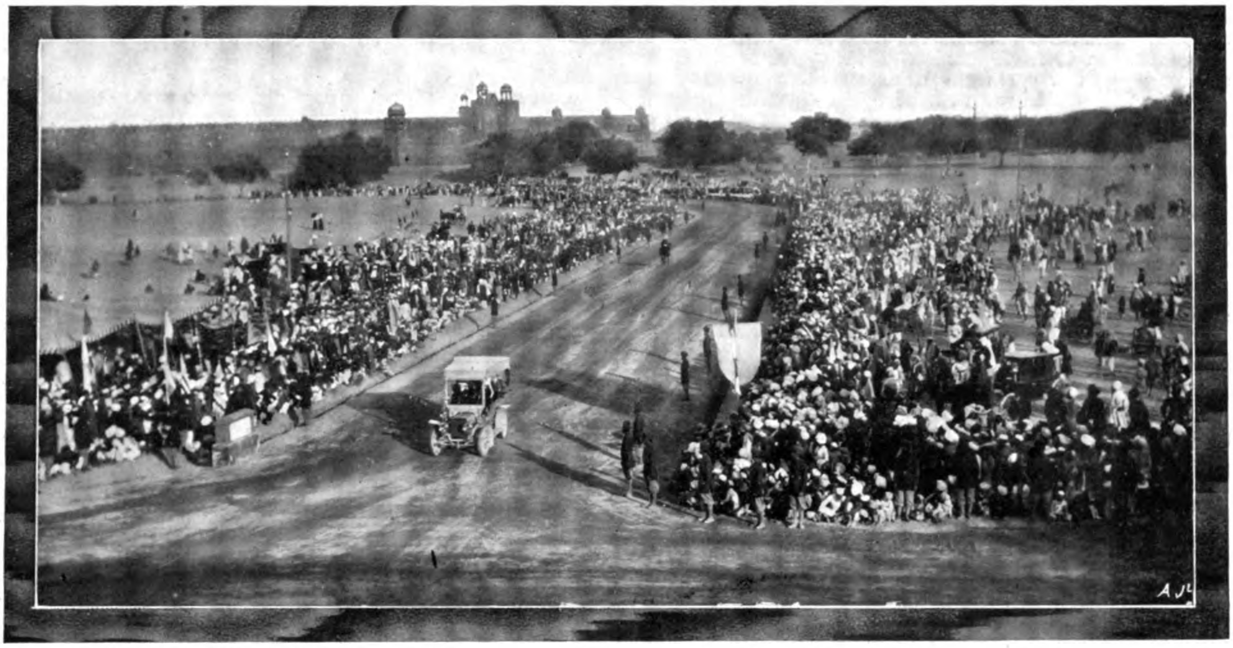
Motoring Parliamentary Candidates.

THE Scottish Automobile Club send us the following list of their members who are candidates for Scottish constituencies :—

Dumbartonshire	Col. Henry Brock.
Kincardineshire	Mr. S. J. Gammell.
Lanarkshire (Govan Division)...	Mr. Harry S. Murray.
Linlithgowshire...	Mr. Alex. Ure, K.C.
Renfrewshire	Sir Thomas Glen Coats, Bart.
Roxboroughshire	Sir R. J. Waldie Griffith, Bart.
Edinburgh, West	Sir Louis McIver, Bart.
Glasgow, Blackfriars	Mr. A. Bonar Law.
Kilmarnock Burghs	Mr. T. W. Macintyre.

New Peer's Title.

BARON NORTHCLIFFE, of the Isle of Thanet, in the county of Kent, is the new title selected by Sir Alfred Charles William Harmsworth, Baronet, upon his elevation to the Peerage.



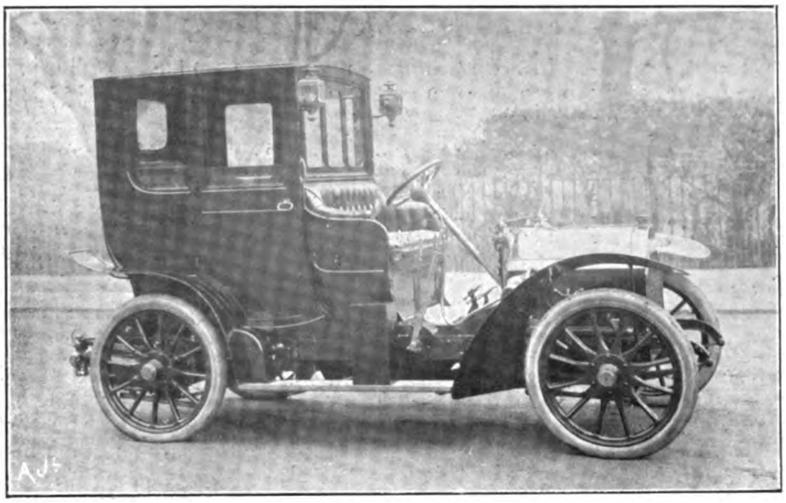
THE ROYAL VISIT TO INDIA.—Motor cars are being very largely used by the Prince and Princess of Wales and their accompanying suite during their triumphal procession through our Indian Empire. In the picture the Prince and Princess are arriving in one of their cars at the Mosque of Jumma Masjid. Their Royal Highnesses were staying at the house built for the Delhi Durbar and in the afternoon motored out and visited the Fort and the Mosque. The route between the Fort and the great Mosque, shown in our picture, was lined by thousands of school children carrying banners with mottoes.

A Generous Offer and its Result.

BY way of marking the advent of the New Year, Messrs. Charles Jarrott and Letts, Limited, determined to send gratis to any of our readers a very artistic little oxydised paper-knife which has been prepared and issued by Messrs. De Dietrich, of Luneville. We gave an illustration of this little present in our issue of December 30th last and mentioned the above facts. As a result, under date of January 8th, we have received the following communication from Messrs. Jarrott and Letts :—

> "Will you be good enough to just put a line in your paper to the effect that those readers who have applied for paper knives, but have not received them, may rest assured that their letters are not ignored, but the applications have been so numerous that the supply is for the moment exhausted. We are, therefore, awaiting a further quantity from Paris. It may interest you to know that we have received five hundred applications for these knives."

Any other readers wishing to secure one of these mementos should lose no time in "booking their order."



A new De Dietrich Brougham specially constructed for town use. It is the first of its kind built by the Luneville firm. The chassis is shorter than other De Dietrich models, giving greater flexibility in traffic and narrow streets. Apart from the driver, there is seating accommodation for four. It was, we learn, a car of this type which secured a Silver Medal in the recent Paris contest for carriages for town use.

To Make Motor Cars.

THE Birmingham Small Arms Company have decided to add the manufacture of motor cars as a "side line" to their business.

An Example to Follow.

NEXT to obtaining a good car is the necessity for securing a good driver, in order to reap the full benefits of automobilism. We are not at all surprised to find, therefore, that Mr. S. F. Edge has decided to deal with this matter, as far as the Napier cars are concerned, with his characteristic energy and thoroughness. In order to supply his clients with really reliable men, Mr. Edge has instituted a training department in which he has would-be drivers taught not only the rudiments, but the full details of their profession. Needless to say, the scheme has been started on a thoroughly sound basis and, while open to all, every precaution is taken to ensure that only desirable men enter upon the course of instruction, and none but the proficient leave it to take service elsewhere.

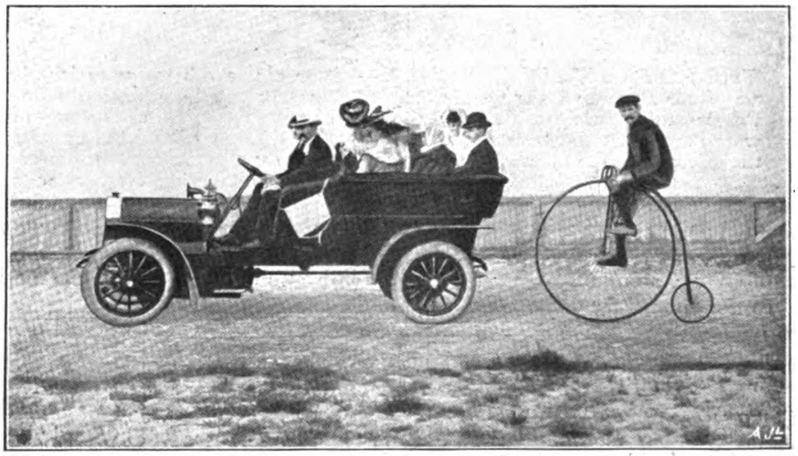
This is, of course, as it should be. For those who are anxious to follow the calling —and there must be many less varied existences—the scheme should be an unqualified boon, for not only are they put in the way of acquiring sound practical knowledge, but they receive a salary at the same time. It is a business proposition from first to last, and Mr. Edge realises only too well that the greater part of the "trouble" experienced with the modern car is due solely to the inefficiency of the driver. Now that the powerful car is becoming more and more a vehicle in which to make journeys as well as to tour, the owner will think twice before engaging a driver who is not an expert in his knowledge of the particular car he is required to drive. Such proficiency has either to be obtained at the owner's cost or the manufacturer's—which renders further comment on Mr. Edge's proposals superfluous.

Rushing the Pole.

THE schemes of M. (Ant)Arctowski for invading the Southern Continent, and if possible reaching the South Pole by motor car, have partially crystallised into a slightly more detailed form. He now proposes, at any rate, to land at the foot of Mount Terror, the spot where the "Discovery" wintered in the 78th degree of latitude. It is "only" (!) 780 miles from that point to the Pole. By utilising three motor cars M. (Ant)Arctowski *thinks* he will be able to reach the Pole. We wonder what some of Captain Scott's dogs, who lie at the bottom of chasms and fissures in the ice, would think about it if they could return to life.

6-h.p. De Dion Cars for 1906.

So justly popular has the 6-h.p. De Dion car become with those requiring a well-built and capable little car of low power, that many of our readers will learn with regret of the exclusion of this model from the regular programme of the manufacturers during the coming season. The arrangements made by the English Company will, however, enable them to still supply a limited number, fitted with three forward speeds and a reverse, to their customers, but it has now been definitely decided that no new model of this power will be introduced this year—in spite of the rumours which have floated about suggesting the appearance of a cheaper 6-h p. vehicle. During this year, therefore, the smallest standard car engaging the attention of this celebrated factory is the somewhat more powerful, single-cylinder 8-h.p. machine.



THE PAST AND THE PRESENT.—Occasionally in out-of-the-way country districts one is startled by the sight of a relic of the past in the form of an old "ordinary" bicycle. As in the case of deceased donkeys, it has always been more or less of a mystery what becomes of them. We are able to account for one of them anyway, in the above photograph, which was secured in Australia in November. H. Tipper, well-known in Sydney athletic circles, is the rider on the "ordinary," and the car is a 16-h.p. Argyll, driven by Mr. H. S. Cusack.

At the November Olympia Exhibition, one of the most striking features in the decorations of the many charmingly designed stands, was the pair of huge pictures which were suspended over the Ducros-Mercedes exhibit. At the Show, it was not easy to obtain satisfactory photographs of these, but we are now enabled, by the courtesy of the firm, to place them upon record in our pages. Above we reproduce the one—the second being given below.

COMMERCIAL POINTS.

United Motor Industries.

AT the recent annual general meeting, as also at an extraordinary general meeting, of United Motor Industries, Limited, a dividend for the year ending September 30th, 1905, was declared at the rate of 10 per cent. At the extraordinary general meeting it was decided, in consequence of the great increase of the business, and also for the purpose of carrying through certain further developments contemplated, to substantially increase the capital of the company. Mr. G. H. Smith has been appointed sole director of United Motor Industries, Limited.

The H. F. Process in France.

THERE appears to be a big trade coming forward in France with the H. F. Vulcanizers in the near future. Messrs. Brown Brothers have recently secured the sole rights for France, and their Paris branch, 31, Rue de la Folie Mericourt, has been enlarged, and special facilities for dealing with the new representation have been added. This department is to be carried out upon the same basis as that upon which Messrs. Harvey, Frost and Co., Ltd., have successfully conducted theirs for the past two years, and the policy of co-operation will be followed, and practically the French motoring public will be treated quite as liberally as they would were they dealing with Messrs. Harvey, Frost and Co., Ltd., in England.

THE Motor Exchange of Great Britain, of Boundary Road, Notting Hill, W., notify us that their sale, announced for the 17th inst., has been postponed, owing to the local parliamentary election occurring on the same day.

New Dunlop Depots.

THE Dunlop Pneumatic Tyre Company, Ltd., have recently opened a depôt in Newcastle-on-Tyne at 11, Big Market, and another at 35, Victoria Street, Bristol. Each of these depôts carries a large stock of cycle and motor tyres, as well as a full complement of the Dunlop Company's specialities, including their well-known rubber goods. The opening of these additional depôts has already proved of considerable convenience to the local and district trade in these centres.

THE British Automobile Commercial Syndicate, Ltd., are exhibiting at 97 and 98, Long Acre, prior to their exhibition at the Crystal Palace, one of the 12–16-h.p. ordinary, and one 20–28-h.p. dustless "Exhibition" Spyker chassis from the Paris Salon.

ON Wednesday of last week, the two younger sons of Mr. Harvey Ducros (Messrs. William and George) opened commodious premises, which are to serve as their Irish headquarters, at 17, South King Street, Dublin. These have a street frontage of about 48 feet, with a front to rear measurement of 123 feet, the cubical contents of the building attaining to over 128,000 feet. At the rear of the main showroom are stock rooms, offices, &c., and behind these again is the workshop, the latter being provided with a fine complement of tools, &c. An examination pit, with accommodation for the simultaneous handling of four or five cars, has been installed. Lathes, designed for English and French engine work, are included in the plant. All the accessories of a first-class workshop for dealing with motor repairs are present. A fireproof concrete pit for the safe storage of petrol is provided, and there are excellent facilities for washing cars, &c. Ranged in the showrooms are some of the latest examples of Panhard and Levassor, Mercedes, Swift, and Gladiator cars. The establishment will be in the hands of Mr. W. H. Kingsbury, as manager.

One of the clever paintings which helped to distinguish the Ducros-Mercedes stand at Olympia. The companion picture is given above.

The Pedrail.

Of the usefulness of the Pedrail—or "walking engine"—which we have so fully described in our pages, there can be little doubt, and we are therefore glad to learn that the first stages of experimenting and perfecting this ingenious machine have now resulted in a scheme for placing the inventions of Mr. Diplock upon a commercial footing. To this end, the public are now invited to subscribe capital to Diplock's Patent Traction Engine Haulage Syndicate, Limited, of 61, Marsham Street, Westminster, for £10,000 in ordinary shares. The machine has already been subjected to very drastic tests by the military authorities, and it has had the honour of having a special Local Government Board regulation promulgated entirely for itself. With the capital now asked for, a larger type of engine is to be constructed, suitable for both road transport and ploughing and other agricultural operations in this country. Public experiments, trials and demonstrations will be carried out, and one of the machines will be put into regular daily work on the road between Liverpool and Manchester, where in ordinary work practical evidence of its durability and earning powers will be afforded. The advantages claimed for the Pedrail are a saving in haulage power of 60 to 70 per cent., with a corresponding saving in fuel, a saving of 50 per cent. per annum in repairs, less depreciation, no damage to roads, no vibration or noise, power to cross soft land or lumpy roads with ease and smoothness, and exceptional hill-climbing powers. We wish the company every success in overcoming the many difficulties in dealing with transport upon a big scale. We have the strongest belief that the Pedrail has a very promising future before it.

NEW COMPANIES REGISTERED.

Bolton Mutual Garage Company (Limited).—Capital, £2,000 in £25 shares. First directors, B. P. Dobson, F. G. Hibbert, E. F. Musgrave, T. Scowcroft, F. W. Thompson, and H. Wood.

British Transport Syndicate (Limited), 55 and 56, Bishopsgate Street Within, E.C.—Capital £4,000 in £1 shares. Object, to carry on the business of motor car, omnibus, and cab proprietors, &c.

Chester and North Wales Motor and Garage Company (Limited).—Capital, £5,000 in £10 shares. First directors, Hon. Cecil T. Parker, E. O. W. Davies, and P. G. Wayne.

Commercial Vehicles Construction Company (Limited).—Capital, £10,000 in £1 shares. Object, to carry on the business of motor car, omnibus, and cab proprietors, &c.

De Veulle Variable Speed Gear Company (Limited), 30, Freer Road, Handsworth, Birmingham.—Capital, £500 in £1 shares. Object, to acquire patents relating to a variable speed gear (patent applied for No. 26,051 of 1905). First directors, F. H. de Veulle (managing director), B. G. Hodgson, and J. G. Accles.

East Lancashire and Manchester Carrying Company (Limited), 20, Prudential Buildings, Oldham.—Capital, £20,000 in £1 shares. Object, to carry manufactured goods from the various centres in and around Burnley to Manchester, by means of steam, motor, and horse wagons. First directors, H. Wolstencroft, J. S. Marland, L. Aspinall, J. J. C. Fletcher, and J. T. Dodd.

Motor and Electrical Engineering Company (Leeds), (Limited), North Street Garage, Sheepshanks Yard, North Street, Leeds.—Capital, £5,000 in £1 shares. Object, to acquire the business of a motor car manufacturer and dealer, &c., carried on at the Garage, Sheepshanks Yard, North Street, Leeds, by James Rebecca, as the Motor and Electrical Engineering Company, including the business of an electrical and general engineer recently carried on in Leeds by P. N. Hirst. First directors, James Rebecca, P. N. Hirst, and A. Matthews.

Motor Coach Syndicate (Limited), 62, London Wall, E.C.—Capital, £8,000 in £1 shares. Object, to carry on the business of mechanical engineers, manufacturers of motor cars and wagons, &c., and to adopt an agreement with G. H. Hayes.

Passey and Hall (Limited), Gloucester Road, Ross, Herefordshire.—Capital, £4,000 in £1 shares. Object, to acquire the business of Passey and Bennett, Gloucester Road, Ross, Herefordshire, manufacturers of and dealers in motor cars, cycles, &c. First directors, H. A. E. Passey, J. H. Hall, W. H. Smith.

L. Rene and Co. (Limited), 6, Snow Hill, E.C.—Capital, £8,000 in £1 shares. Object, to carry on the business of manufacturers, vendors, &c., of motors, motor accessories, &c. First directors, T. F. L. Rene, W. Osmond, S. Feast, and F. Best.

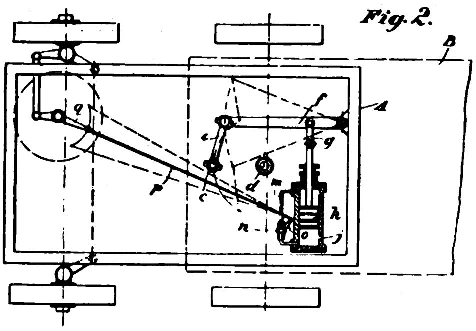
Rugby Motor, Cycle, and Engineering Company (Limited).—Capital, £2,000 in £1 shares. Object, to take over the business of C. P. Spencer, at 47, Park Road, Crouch End, N., carried on as the Rugby Cycle, Motor, and Engineering Works. First directors, C. P. Spencer, W. T. Tucker, and H. G. Alldis.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

19752. 30th September, 1905 Improvements in Road Vehicles. The British Thomson-Houston Company, Limited, 83, Cannon Street E.C. (A communication from the Allgemeine Elektricitäts-Gesellschaft, Schiffbauerdamm 22, Berlin.) This invention relates to vehicles which consist of a front wagon and a rear or trailer portion, coupled together in such a manner that each part may move independently about the coupling pin. In this class of vehicle the trailer has a tendency due to its kinetic energy to turn the front wagon round more than is desired when the vehicle is turning a corner at any speed or deviating from a straight course when descending a steep gradient. The object is to overcome this objection, and for this purpose a liquid pump is employed, and set in action when one portion of the vehicle moves about the coupling pin relatively to the other portion. This pump consists of a cylinder, fitted with a piston, and containing a liquid such as oil. There are two figures. Fig. 2 is a plan of the vehicle. A, is the frame of the front wagon, and B, that of the rear portion or trailer. *c*, is a pin secured to the front portion of the frame of the trailer and adapted to describe an arc of a circle, having the coupling pin, *d*, as a centre when the front wagon moves relatively to the trailer. A link, *e*, is coupled at the one end to the pin, *c*, while its other end is pivotly secured to the one end of a connecting-rod, *f*, which is suitably secured at its other end in the frame, A, of the front wagon. Intermediate the ends of this connecting-rod a link, *g*, is pivoted, the other end of which is connected to piston-rod of piston, *h*, of the liquid pump, *j*. When the piston, *h*, is reciprocated, the liquid contained in the cylinder on one side of the piston is forced through the pipe, *m*, into the cylinder on the other side of the piston. The pipe, *m*, may be made of small bore throughout its length, so as to provide a constant resistance to the flow of the liquid and so prevent a sudden movement of the piston, or it may be provided with an adjustable check-valve, *n*, operated either manually by the driver of the vehicle or by the movement of the vehicle itself through the rod, *p*. The rod, *p*, is connected at one end to the lever, *o*, and at the other end to the lever, *q*, which is directly connected to and operated by the steering gear of the vehicle, so that the area of the fluid passage may be varied according to the deviation o the front wheels of the vehicle.—December 20th, 1905.

Fig. 2.



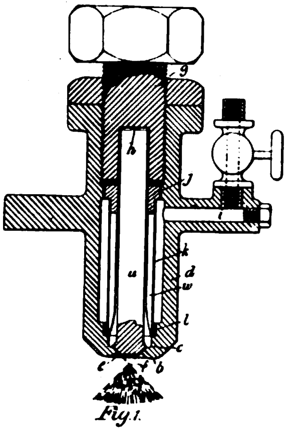


Fig. 1.

27618. 17th December, 1904. Improvements in and relating to Means for Atomising Liquid and Gaseous Fluids. Charles F. de Kierzkowski-Steuart, St. Stephen's Club, Westminster. The objects sought to be attained by the improved atomiser are to effect the atomising of a liquid or gaseous fluid to a greater degree of fineness than hitherto possible, and to mix the fluid with air by means of apparatus which is simple and inexpensive to make accurately, and which is readily taken to pieces for cleaning. In forming the very fine passages for oil, it is necessary that the greatest accuracy should be attained, so that the jets of fluid issuing from the passages may meet accurately and thus be properly broken up at the point of meeting. There are twelve figures. Fig. 1, is a sectional elevation. A coned plug, *a*, fits closely into a coned seat *b*, formed in the inner end, *c*, of a tube or chamber casing, *d*, into which the fluid is pumped under pressure through the passage, *i*, which may be controlled by any suitable valve or cock. The conical suface of the plug, *a*, has formed in it grooves or channels, *e*, preferably V-shaped in cross section, and corresponding in number and passage area to the quantity of fluid required to be passed. These grooves may in certain cases be enlarged gradually in the direction of discharge. The axes of these grooves are inclined to each other and intersect each other at a common point, *f*, in front of the apparatus. The fluid under pressure passing through these channels issues in fine jets, which all impinge at the common intersecting point, *f*, and break one another up into fine particles. The coned plug is held to its seat by a screwed cap, *g*, which may be screwed up so as to bear against the tail, *h*, of the plug, and hold the plug tightly to its seat, whereby no fluid can escape except through the grooves in the plugs. The cap is secured in place and leakage prevented by means of a lock-nut, packing being provided if necessary. A fine meshed wire gauze filter, *k*, fastened to top and bottom rings, *j* and *l*, which fit loosely in the casing, is placed around the stem of the plug. The gauze may be strengthened by the ribs, *w*, secured to it or to one or both of the rings.—December 20th, 1905.

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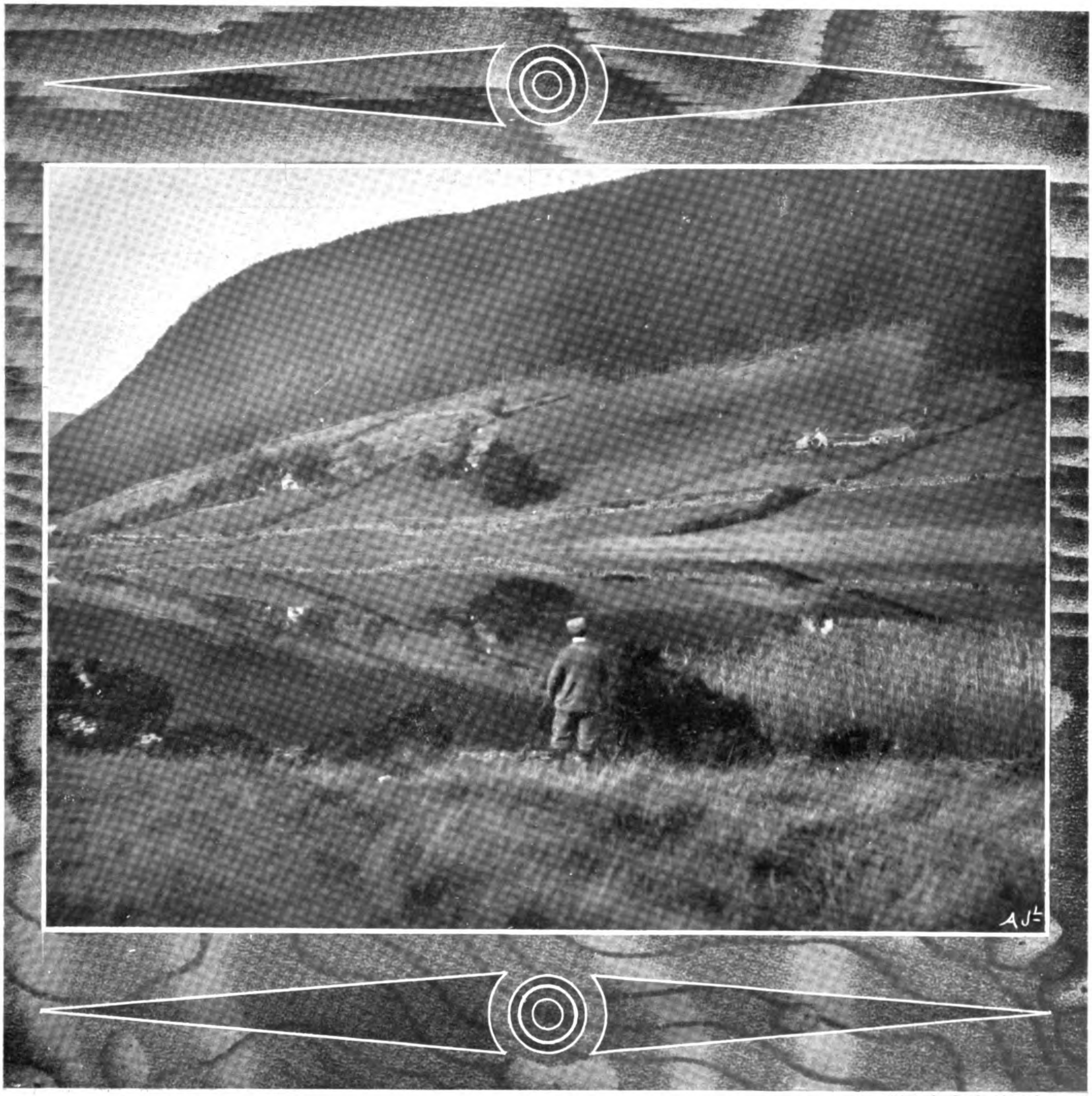

Photo by R. J. Mecredy.

THE PICTURESQUE SIDE OF MOTORING IN IRELAND.—A view at Glendalough; a charming scene in the Emerald Isle. This photograph is a remarkable one, as, beyond the point where the figure is seen standing, the whole of the foreground is really a lake, a fact which at first glance is in no way apparent. The reflections in the photograph are so perfect that until it is carefully studied it is a difficult matter to tell where the lake ends and the land begins. By carefully comparing houses, fences, &c., which are duplicated, the line defining the end of the land and the margin of the lake can be located.

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DIARY OF FORTHCOMING EVENTS.

British Events.

Jan. 19–27 ...	Birmingham Motor Show.
Jan. 26–Feb. 3	Crystal Palace Motor Show.
Jan. 26–Feb. 3	Edinburgh Show.
Jan. 27 ...	Tri-Car Hill-Climb, Lewisham A.C.
Feb. 15 ...	*4,000 Miles Tyre Trials.
Feb. 15 ...	*Lamp Trials.
Feb. 9–17 ...	Liverpool Motor Show.
Feb. 9–17 ...	Newcastle Motor Show.
Feb. 10 ...	Tri-car Hill-Climb, River Hill (Lewisham A.C.).
Feb. 19 ...	Scottish A.C. (Western) Annual Dinner.
Feb. 23–Mar. 3	Manchester Motor Show.
March 8 ...	A.C.G.B.I. General Meeting.
March 9–17...	Glasgow Motor Car Show.
March 24–31	Cordingley and Co.'s Motor Show.
June ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
Aug. ...	*Van Trials.

Foreign Events (Trials, Races, &c.).

Jan. 22–27 ...	Ormond-Daytona Beach Races.
Jan. 26–30 ...	Calcutta Motor Trials.
Feb. 3–18 ...	Berlin Motor Show.
Feb. 3–18 ...	Turin Automobile Show.
Feb. 5–11 ...	Paris Voiturettes and Tri-car Trial (*Les Sports*).
March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
April 1–17 ...	Budapest Exhibition (A.C. of Hungary).
April–May ...	Milan Exhibition.
April ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 13–14 ...	Tour de France (Motor Cycles and Voiturettes).
June 10–16 ...	Herkomer Cup.
June 28–29 ...	Kiel Motor Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15–16...	Mont Ventoux Hill-Climb.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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NOTICE.—An 8-page Index to Volume X. is issued free with the current week's number of "The Automotor Journal."

PASSING EVENTS.

The Importance of Figures. We are glad to find that the statistics we published last week of automobile imports and exports of the last few years have attracted, amongst other contemporaries, the attention of the *Financial Times*, which devotes a lengthy and well-considered article to the figures which we then published, and to the conclusions which we drew from them. Our contemporary recognises the importance of these statistics as evidence of the *role* which the automobile industry is now playing in the national commerce, and recognises how fully the statistics have established the claim of the new industry to take rank as one of the most important business spheres with which the activities of the United Kingdom are now concerned. We are particularly pleased to see that a journal of the standing of the *Financial Times*, in the first paragraph of the article, joins with us in issuing a warning against the dangers of present prosperity and satisfactory prospects tending to reproduce a recrudescence of dangerous company promoting, such as nearly wrecked, and for a long time retarded, progress in the early days of the movement. Says the *Financial Times*, "We hope that the pace will not be forced, either as regards the number of miles run per hour or the financing of the manufacturing concerns."

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The Meaning of a Cold Douche. On one point the *Financial Times* misunderstands us. It quotes our words referring to the hope we expressed that should, in the coming Parliament, anti-motor cranks "make their customary attempts to cripple the growing industry by ill-advised and narrow-minded legislative restrictions, their ravings may receive a suitable cold douche of statistics," and raises the query as to what ravings at St. Stephen's have to do with imports and exports. We are glad to have an opportunity of providing the explanation. What we meant, and what we should have thought was obvious from our words is, that when the aforesaid cranks think fit to air their views in Parliament, the statistics now available, the statistics which we published, and the statistics which the *Financial Times* appreciatively quotes, would be used by those in the House of Commons, who are interested in the welfare of automobilism, to squelch reactionary attempts to injure or interfere with the industry. The way in which the automobilist Members of the House of Commons would employ them as a cold douche, would be simply to point out that an industry which can boast such figures, and claim such importance in the national economy, is not likely to allow itself to be "snuffed out" by legislation if it can help it, and that legislation designed to snuff it out, or seriously injure it, would be proved by the statistics to be absolutely opposed to the interests of the community. Such arguments, if advanced on the basis of the statistics to which we refer, should certainly prove an "anti-spasmodic" to the good people who in the past have been so prone to allow prejudice to outrun discretion where the question of automobilism has been concerned.

More Motor Road. Every week, in fact almost every day, the London to Brighton motor-road project comes up smiling. The persistency and imperviousness to logic and common-sense of the various writers who are advocating it in the Press is reminiscent of Goldsmith's "Village Schoolmaster." Motorists and all the great bodies representing the motor car interest have, with commendable perspicacity, held aloof from it. They have all seen more or less clearly, what the enemies of automobilism saw also from the first, that the proposal provides a splendid argument for those who, like the Rector of Crowhurst, maintain that "our highways were not constructed for motor traffic, and therefore separate motor roads appear a step in the right direction." It should give every automobilist pause that the bitterest enemies of the movement, the people who want to see the motor car improved off the face of our roads, and horse-drawn, donkey-drawn, and nursemaid-drawn vehicles regain their former undisputed sway, are the very people who, next to the promoters of the motor road, wish to see the proposal carried out. If the London to Brighton motor road materialises, and the company does not immediately go into liquidation, other roads will be constructed, and it does not require the eye of a prophet to foresee that when that day dawns the Highways Protection League and all its sympathisers will advocate the protection of the highways, and with some show of reason too, by the confinement of the motor traffic to the motor roads, and its interdiction or limitation to some preposterous rate of progression, such as 5 miles an hour on all the ordinary highways of the country.

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The Real Question at Issue. We do not propose to consider the points which we have discussed before, as to whether the project is commercially feasible, whether it can ever pay a dividend, or whether automobilists are ever likely to pay at all largely for using it unless their speed on ordinary roads is restricted to an absurdity. The fact is that, from the point of view of the interests of automobilism, it is the suggestion itself that is the thing to be deprecated. That it should, by puff preliminary, puff prospective, pushing, log-rolling, or any other methods of locomotion, be ultimately wheel-barrowed into the House of Commons, is what, in the interests of the movement, we most heartily dread to see. If the proposal ever goes that far, the enemies of automobilism, and the enemies of general road improvement too, will be provided with a two-edged weapon. "See," they will say, "the motorists themselves know that their atrocious vehicles are unfitted for the public roads, and are arranging, or supporting those who are arranging, to build special roads for them." That will be one edge of the weapon! The other edge of the weapon will be this. "Now that the motorists are building, or are preparing to build roads for themselves, let us force them on to them, and off the ordinary highways of the country by reducing the speed limit (on ordinary highways) to such an extent that they will prefer to motor round their back gardens rather than venture out on the highway. Then they will build more motor roads, and there will be still fewer motor cars left on *our* highroads. Then the innocent school-children will be able once more to play at every corner as in the happy days before 1896, the horses of the staid barouche will no more be flustered by the approach of modern locomotion, our main roads will return to their state of idyllic repose (and comparative uselessness to the community), and the only people who will be really sorry will be the police, in whose lives the sport of motor-trapping has recently provided so welcome a relief from monotony!"

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Monopoly v. Public Interest.

The question is a wider one than even its effect upon the future of the automobile industry, all-important as that undoubtedly is. There are considerations of jurisprudence and public policy, and they are specially suggested by the argument put forward in some quarters in favour of the motor road project, that the railway companies have in the past been allowed to do the same thing to the general benefit of the country and the public. Now the cases are not on all-fours in the slightest degree. It is true that the railway companies have been allowed to build special roads for themselves, and have been allowed to establish restricted monopolies upon them, and consequently to obtain substantial profits on their invested capital, but they have been allowed to do this not merely because they built roads, but because they also provided the rolling stock. To make the cases similar, the proposal should be for a company not merely to build a motor road from London or Croydon to Brighton but to provide motor cars that are specially designed to run on it, and to simply take passengers or produce at a fixed rate. In addition, it must be remembered that the great monopolies which have been permitted to the railway companies and the power to obtain the land required by compulsory purchase, were only granted for certain considerations. The public, as represented by the Board of Trade, has the power to control their affairs and control their tariffs. The State has, for instance, invariably exacted as a *quid pro quo* for the enormous concessions granted, that the companies should run certain services of "Parliamentary" trains at a fixed scale of charges, should supply in addition a certain number of "workmen's trains," and submit to a variety of regulations for the benefit of the public as devised from time to time by the Board of Trade. If a motor road is to be built, it is quite obvious that the company building it will have to be provided with powers of compulsory purchase. What will they have to offer as a consideration to the general public for this great concession — this tremendous inroad on the rights of the private individual? Unless they engage not merely in road building, but in catering for transport and so put themselves on a level with the railway companies, we do not see how they can offer anything at all. And should they do this they will, naturally and quite legitimately, be opposed by the railway companies, of whose *locus standi* in opposing the Bill there could then be no question whatever. In fact, we do not imagine that the proposers of the scheme for a moment grasp, at all fully, what a tremendous departure it would be in English legislation to allow private individuals or a private company to make a great road under compulsory purchase, for the use of privately-owned vehicles, and then to hold a complete monopoly of it. It would, at any rate, be a derogation on the part of the State and its constituent communities of one of its important primary duties. If roads require making because existing roads are inadequate, surely, considering that monopolists could give no real consideration to the public in return, that alone is sufficient to show that undertakings of the kind ought to be carried through by the State for the benefit of everyone.

Registered in Guernsey.

After all these observations on the question, it comes as something of an anti-climax that the company which proposes to build the road, irrespective both of the true interests of the automobile movement and of the general public, and in the teeth of what appears to us to be unanswerable arguments, should be "registered in Guernsey." Companies are usually registered in Guernsey because the comparatively stringent regulations as regards the formation of companies do not apply in that island. It has not been generally regarded as a recommendation in a new company's favour that its registration has taken place in Guernsey. We should certainly be surprised if it proved a recommendation in the eyes of the House of Commons, of any Committee that might be appointed to consider the question, or even of any prospective shareholder in this very questionable project.

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The Canal Experiment.

The first stage of the long-distance experiment with the suction-producer-gas motor barge, built by Messrs. Thornycroft, has brought to light some very instructive information. The barge is transporting a heavy load consisting of 11 tons of zinc and 4½ tons of coal, towing behind it a "butty" boat loaded with 23 tons of sugar, and reached Birmingham from London *viâ* the Uxbridge and Grand Junction Canals. As far as the reliability, economy, and adaptability to the circumstances of the motor barge was concerned, the experiment has been very successful, and as an example of economy in fuel consumption, it may be mentioned that the 135 miles traversed involved the consumption of only 18 cwt. of coal. Of course, improvements will be made in the future. This is the first attempt to apply a suction-gas motor to canal work in this country, and it has already been demonstrated that the outlook is encouraging. From particulars of the journey which we gather from the excellent account given in the *Standard* by Mr. Thomson, who is in charge of the expedition, probably equally good speed and considerably greater fuel economy would have been obtained under the circumstances with a smaller motor, while a great deal of trouble would have been saved had some other form of propeller—not one of the reversible type—been employed.

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Some of the Alterations Our Canals Need.

More important still, however, is the undoubted fact, forcibly demonstrated by the experiment, that our canals, as they exist at present, need a good deal of alteration if they are to become great means of transport upon which the advantages of the motor-propelled barge can be fully brought into play. The average speed was singularly slow, not greatly exceeding that of horse-propelled canal boats. It was slow for two reasons, partially because, owing to the shallowness of the canals, even the 24-h.p. motor with the load carried, and the resulting draught, could not get up a high speed, and partly owing to the great delays occasioned by inefficient construction, particularly at the locks. It took the Thornycroft boat no less than six and a half days to make this first part of its 1,000 miles' trip. Most of the existing locks, in fact, are not built for economic or rapid transport, as is evidenced by the fact that on one occasion the motor barge and its "butty" boat were unable to get satisfactorily inside a lock owing to such a ludicrously trivial occurrence as entanglement with a deceased cat. As our canals exist at present, the number of locks is much too great. No less than 159 had to be negotiated in the 135½ miles traversed between London and Birmingham. In most cases a great deal of improvement could be effected by adequate embankment and excavation, though that, of course, involves considerable expense, while if high speeds are to be attained on the straight stretches, that is, between lock and lock, the canals will not only have to be in some places widened but also in most cases considerably deepened. What is needed even more, however, is the more general introduction of up-to-date methods in building the canals, including, for instance, the employment of hydraulic lock-lifts, such as those on some of the great Continental canals, and like the Foxton lifts on the Grand Junction Canal in this country, by which a bunch of barges can be raised from one level to a much higher level at a single operation, and the number of locks in consequence enormously reduced. Canal transport, properly organised, ought to be a very valuable national asset. It is valuable even as it exists at present, for it enables immense quantities of goods, where the time incurred in transport is not a serious consideration, to be transported at very low cost, and it forms the best solution to the difficulty of conveying unusually bulky things from one place to another. But it is quite plain that if canals are to be brought up to modern requirements and to be capable of enabling motor propulsion to exercise its full benefits, large expenditure upon them is urgently required. As motor traction progresses, however, it will become more and more obvious that this expenditure will be ultimately worth incurring, and we may hope in consequence to see it undertaken at an early date on a large scale.

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The "Direct-Drive" Patent Claims.

It is asserted, on very good authority, that the proprietors of the Renault patent, which claims to confer, as we have already explained on more than one occasion, a monopoly for the use of "direct drive" on live-axle cars, have decided on making a fight of it in this country, and that before very long we shall see the preliminaries of a test action in full swing. A large number of manufacturers, needless to say, will be threatened, though so far we have not heard anything in the nature of threats against private users, such as were freely uttered by the proprietors of the quondam Maybach carburettor patent—a course which we commented on at the time as savouring of hitting below the belt, commercially speaking. But it is useless to deny that in the impending action a very serious menace to a large number of motor car builders is involved. Needless to say, it will be met by organisation of those likely to be affected, and the natural and proper organisation to take up the matter is, it is equally needless to remark, the Society of Motor Manufacturers and Traders. There are indications that the fight will be a thorough one. At any rate, we have reason to believe that the proprietors of the patent have the opinion of the present Lord Justice Moulton (given before his elevation to the Bench) in favour of the validity of the patent. This need not disquiet the threatened manufacturers unduly. In the first place, Lord Justice Moulton, through his long and celebrated career as a barrister, was almost invariably extremely optimistic in regard to the merits of any patent that appeared to him to constitute a genuine invention, and in the second place, as everybody of experience in such matters knows, the opinion of the ablest counsel in such cases is entirely limited by the material put before him. In other words, a search is made by patent agents or solicitors, or both, who are supposed to turn up all the anticipations which they can come across, and it is on these anticipations that the barrister gives his opinion. If the preliminary search has not been a thorough one, the opinion of the greatest patent counsel in the world would naturally be of little value. In this connection it is interesting to remember that the patent which did most to upset the validity of the Maybach carburettor was only unearthed at the last moment, after the results of the regular search had already been placed before counsel.

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Mainly a Matter of Funds.

All patent litigation, however, is exceedingly expensive, and if the owners of the patent are well provided with funds, and are willing to take matters finally up to the House of Lords, the funds which the united defendants should have at their back should not be far short of £10,000. A case of this magnitude usually costs, where the best barristers and experts are employed on both sides, from £1,000 to £2,000 in the Court of First Instance, from £500 to £600 in the Court of Appeal, and from £3,000 to £5,000 in the House of Lords, and the party that ultimately loses there, if the case is carried so far, has the privilege of paying the lot.

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Amendment of a Patent —and its Effect.

We also understand that the owners of the patent intend to amend it, in connection with which a point in patent law should prove of interest, viz., that the owner of an amended patent cannot recover either damages or an account of profits for infringement committed before the date on which he amended it. Thus, supposing the patentees were to go into Court now without amending their patent, and win there a test action, they would be able to obtain damages or an account of profits from all manufacturers who had infringed up to the present, while they would also be able to obtain royalties from all manufacturers in future. If, however, they now amend, they would not be able to recover anything for what has been done in the past, and could only enforce their claims from now on, or to be more correct, from the date when their amendment is allowed. Needless to say, all interested parties who have the right to oppose such amendment, are only likely to succeed in their opposition if the proposed amendment is such as would widen the scope of the invention.

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Motor Yeomanry.

THE notion of yeomanry mounted on bicycles will probably excite the scorn or hilarity of a good many old-fashioned officers. But it is a military reform which we are likely to see generally adopted in the near future. At the last reconnaissance held by the South Nottinghamshire Yeomanry, one of the men put in an appearance on a motor bicycle. He justified the indulgence extended to him, for during the manœuvres he proved himself more useful for conveying communications from point to point than a dozen of his horsed comrades. The result is, that instructions have been given that as many as three yeomen per squadron may in future attend mounted on motor bicycles.

THE 1906 SIX-CYLINDER NAPIER CARS.—PART II.

The 60-H.P. Chassis.

QUITE straight, though of tapering cross-section, are the long side-members of the pressed-steel frame, which are largely tied together by the engine and by the gear-box, since both these portions of the driving mechanism are secured rigidly to them at both sides. Otherwise the side-members are only cross-connected at the extreme rear, also just behind the gear-box, and finally by a curved member beneath the radiator through which member passes the starting handle. For lining up the engine and the gear-box true with the frame, metal packing-pieces are first fixed to the inner faces of the side-members, and these are machined up in place by being planed. The engine or the gear-box can thus be removed and replaced without difficulty at any time, and there is no tendency for the frame to be distorted when the bolts by which they are held in position are pulled up quite tightly. At both ends, the side-members are so shaped that they form projecting hangers for the springs.

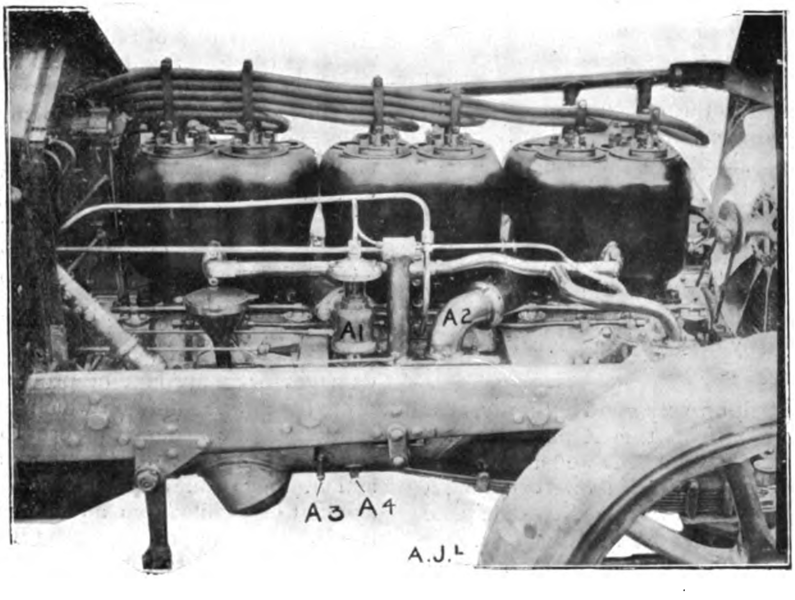

Fig. 1.—The 60-h.p. Napier Car.—View of the 6-cylinder Engine, fixed in place, from the "off" side.

The long semi-elliptic rear springs are fixed above the live-axle, and have shackles at each end, like those on most chain-driven cars; they lie, moreover, outside, instead of beneath, the frame. Radius-rods are also employed for tying the axle-casing to each of the side-members, but the spring-brackets to which they are coupled-up at their rear ends ride quite freely about the axle-tubes; very noticeable, indeed, is the fact that grease-cups are fitted to these spring-brackets, for this emphasises the importance which is attached to this point. Neither the springs nor the radius-rods take the "torque" of the axle-casing, and thus the duty of each is clearly defined; the springs merely take the weight of the body and are free to absorb road-shocks, while the sole function of the radius-rods is to transmit the "drive" from the axle-casing to the frame. The "torque" of the axle-casing is taken by the long tubular casing that surrounds the propeller-shaft and is rigid with the axle-casing.

In front, the semi elliptic springs are provided with shackles at their rear ends, as usual, and these springs lie beneath the side-members. The axle is a curved forging having an **I** cross-section, and the forked portion of each steering-head is formed solid with the short stub-axle that carries the road-wheel. Ball-bearings are used for the road-wheels. Particularly substantial in design is the steering-gear, this being of the screw-and-nut type with a rack-and-pinion between the nut and the rock-shaft. All back-lash between the screw and the nut can easily be taken up, since the nut is formed in two parts; provision is also made for preventing any end-play of the long shaft inside the steering-pillar, this being fitted with adjustable ball-thrust-bearings.

Other characteristic features of this chassis, which are, however, common to all three 6-cylinder models, are the solid aluminium dash-board, the metal sheathing that completely protects the engine, the clutch and the gear-box on the underside, and the large petrol tank which is fixed beneath the frame at the back; the fuel is fed from the tank by pressure, maintained by the exhaust-gases. The foot-brake is provided with a water-cooled drum, and on the 60-h.p. model the brake-band is normally held clear of the drum by a simple tie-bar that passes across from side to side of the frame.

The 60-h.p. Engine.

It is naturally around this large 6-cylinder engine that the chief interest centres, particularly as it differs in many important respects from those built by the Napier firm hitherto. Most marked perhaps is the impression of simplicity which is at once conveyed by it, for its neatness and compactness go a long way towards disguising its real size. And yet every part that is at all liable to require attention has been rendered quite easy of access, since there is no crowding at any one spot. The chief innovations of a radical character include (1) an absolutely automatic system of lubrication which eliminates the ordinary sight-feed fittings on the dashboard (2) a simplified mechanism for operating and timing the standard ignition apparatus, with its high-tension distributor that permits of using a single induction-coil, and (3) the optional provision of a high-tension magneto to afford an auxiliary and entirely distinct ignition system for those who desire it.

In Figs. 1 and 2, this 60-h.p. engine is shown fixed in place in the chassis, Fig. 1 being a view from the "off" side, and Fig. 2 being taken from the "near" side. The engine is, however, also illustrated alone in Fig. 3, which includes four distinct views—one from each side and one from each end. The engine from which Figs. 1 and 2 were taken is not fitted with a magneto, but that shown in Fig. 3 has this auxiliary high-tension system installed upon it.

Referring to these illustrations, it will be seen at a glance that the cylinders are cast in pairs, with all the valves on the same side, that the crank-chamber is formed by two large castings jointed together horizontally through the centre-line of the crank-shaft, that the upper of these two castings is provided with four projecting feet for fixing the engine to each side-member of the main frame, and that there is a large oil-well, A^6, at the bottom of the lower casting for collecting the oil as it flows down from the bearing-surfaces.

Cast solid with the cylinders are the heads, the jackets and the valve-chambers, and above each valve is a screw-threaded inspection-plug. Forming the top of each jacket, however, is a large circular cover plate to which the six-way, branched return-pipe for the cooling water is bolted, while immediately above the hollow, central bolt that holds the cover down in place is a relief cock through which paraffin can be introduced inside the cylinder. The valves are of large diameter, and are kept close up to the cylinder proper, while special care has been taken in the design to facilitate the flow of the gases through the inlet and exhaust passages, and to effectively jacket the valve-chambers. For each pair of cylinders, the two inlet-valves lie between the two exhaust-valves, and thus there is only one induction-pipe connection—but two exhaust pipes—to each casting.

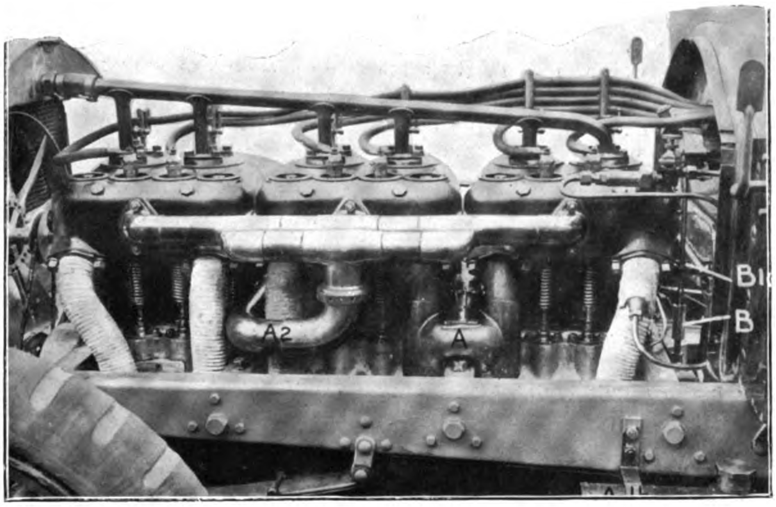

Fig. 2.—The 60-h.p. Napier Car.—The 6-cylinder Engine, as seen from the "near" side of the car.

As with all other parts that can affect the accuracy of synchronism between cylinder and cylinder, special precautions have been taken to ensure that each cylinder shall receive the same quantity of explosive mixture from the carburettor. To this end, the induction-pipe, A^2 — which passes across from the other side of the engine — is provided with double branches (as seen in Figs. 2 and 3) that render the effective distance of the carburettor identical from each inlet-valve. The carburettor draws its main air supply through the pipe, A, from the neighbourhood of two of the exhaust-pipes, the pipe, A, passing across behind the central cylinder-casting in just the same way that the induction-pipe, A^2, passes across in front of that casting. Thus it is that the carburettor is made to occupy a convenient position on the right side, and does not interfere with the accessibility of the valve-gear on the other side.

The cylinders themselves are not only bored out in the usual way, but are finished off dead true in a special grinding machine, which ensures absolute accuracy of their bearing-surfaces, and saves much of the tedious work of bedding in—by driving the engine round prior to complete erection—which has hitherto been a very lengthy process. Similarly also, the pistons, each of which is fitted with three rings, are ground true on an emery grinder, and are therefore rendered strictly interchangeable. The pistons themselves, like the connecting-rods, are remarkable examples of light but strong construction, and it is, of course, largely due to this fact that an engine with a 5-inch bore and 4-inch stroke can run so fast and so sweetly as does this engine. Their shell is very thin, of uniform thickness, and is stiffened up by internal webs, while the connecting-rods, which are circular in section, are bored out from end to end, so that they form tubes having quite a thin wall, and their big-end bearings (with their caps) are quite the lightest which we have yet seen on any such engine. These are, in fact, some of the parts which form the particularly noteworthy features of this engine—moving parts which are extremely costly to manufacture, but enable a considerable reduction of weight to be effected.

Right inside the crank-chamber, running the entire length, and almost immediately beneath the valves, is the cam-shaft, the two spur-wheels for driving it being also enclosed in the chamber. The cam-shaft, with its twelve cams, is made in one solid piece, and the cams are accurately shaped by an automatic machine tool that has been built for this particular purpose; there is thus no risk of a cam becoming loose, nor is there any band fitting that might cause a slight variation in the action of the valves. Beneath the cam-shaft, which (together with its brasses) slides into place from one end of the crank-chamber, a trough is formed in the upper casting of the chamber, this trough being kept full of oil by the overflow from the lubricating system.

The cam-shaft—like the crank-shaft—is supported by four bearings in all, there being two intermediate bearings in addition to those at each end of the crank - chamber. Both ends of the cam - shaft project through the main casing, that in front being fitted with a pulley for driving the fan, and that at the rear having an enclosed worm-gear by which it operates the "commutator" and distributor on the dashboard through the agency of the vertical shaft seen in our illustrations. This vertical shaft now provides a very simple "timing" gear for advancing and retarding the ignition, for inside the socket, B, is a spiral thread that produces a rotary motion between the upper and lower portions of the shaft when the sliding collar, B^1, is raised or lowered by the hand-operated fork that engages with it.

Above each cam is a push-rod with its guide, the guide sliding down into place and being held there by two set-screws. The push-rods are all provided with hardened-steel rollers and with adjustment screws for "setting" the valves. In Fig. 3, it will also be noticed that enclosed gearing is fitted to the crank-chamber, on the left side, in such a way that the cam-shaft is made to drive the lubricating pump, A^7, beneath; of the lubricating system, we shall, however, have more to say presently.

Very long are the four bearings that support the crank-shaft, and each of them is fed with oil from one of the branched pipes that lie alongside the cylinders on the right-hand side of the engine. The shaft itself is made of very special steel—chrome steel—and is not only ground true like most other parts of the engine, but has counterbalance weights to render the running even more steady than it would be without them; it seems curious at first sight that a crank-shaft of this character should benefit appreciably from any counterweights whatever, but the Napier Company are not the only firm who have found them to be a distinct improvement on even multi-cylinder engines. At its front end the shaft carries a sprocket-wheel for driving the water-pump and the centrifugal governor, A^8, and at its other end is a flange coupling to which is bolted the fly-wheel. In Fig. 3 the arrangement of the circulating-pump, the governor, A^8, and the automatically-controlled throttle-valve that forms a part of the carburettor is rendered self-evident, all three being seen to be in line with one another. Fig. 3 also indicates the position that is occupied by the magneto when that auxiliary ignition system is fitted. The magneto itself sits above the water-pump, and is driven by a chain from a second chain-wheel on the pump-spindle.

In any case, however—whether a magneto is employed or not—a safety clutch device is introduced between the pump and its chain-wheel, so that if any obstruction should find its way into the pump the clutch would come into operation and prevent any damage from being done; strictly speaking it is not a clutch that is used, although the effect is equivalent, for the drive is taken through easily renewable pins that would break directly any abnormal strains were imposed upon them.

The carburettor employed is of precisely the same design as that described by us on June 17th last, and it is, therefore, unnecessary to repeat what was then said about it. Its compensating, hand-controlled throttle-valve is coupled up to the smaller of the two hand-levers above the steering-wheel, and its quick-acting throttle-valve is operated solely by the governor. An accelerator-pedal, however, is interconnected with the governor mechanism, and the governor is normally so set that it comes into operation when the car speed is about 20 miles per hour on the top gear. For driving slowly in traffic, therefore, the hand-throttle is usually employed, and the governor is then ready to prevent "racing" under any circumstances that may arise when driving; the driver also knows that the car is not exceeding the legal limit so long as his foot is clear of the accelerator-pedal. In the country, of course, one can either control the speed by hand, keeping the pedal depressed, or can run entirely "on the governor." This double system of control is, as may be judged, particularly convenient and satisfactory.

Other provisions that are made in connection with the carburettor are visible either in Fig. 1 or in Fig. 3, or in both these illustrations. Between the main air supply pipe, A, and the carburettor is the hydraulic regulator, A^1, that is operated from the cooling-water system—by the pressure, and, therefore, in accordance with the speed of the engine—and above the mixing-chamber is an

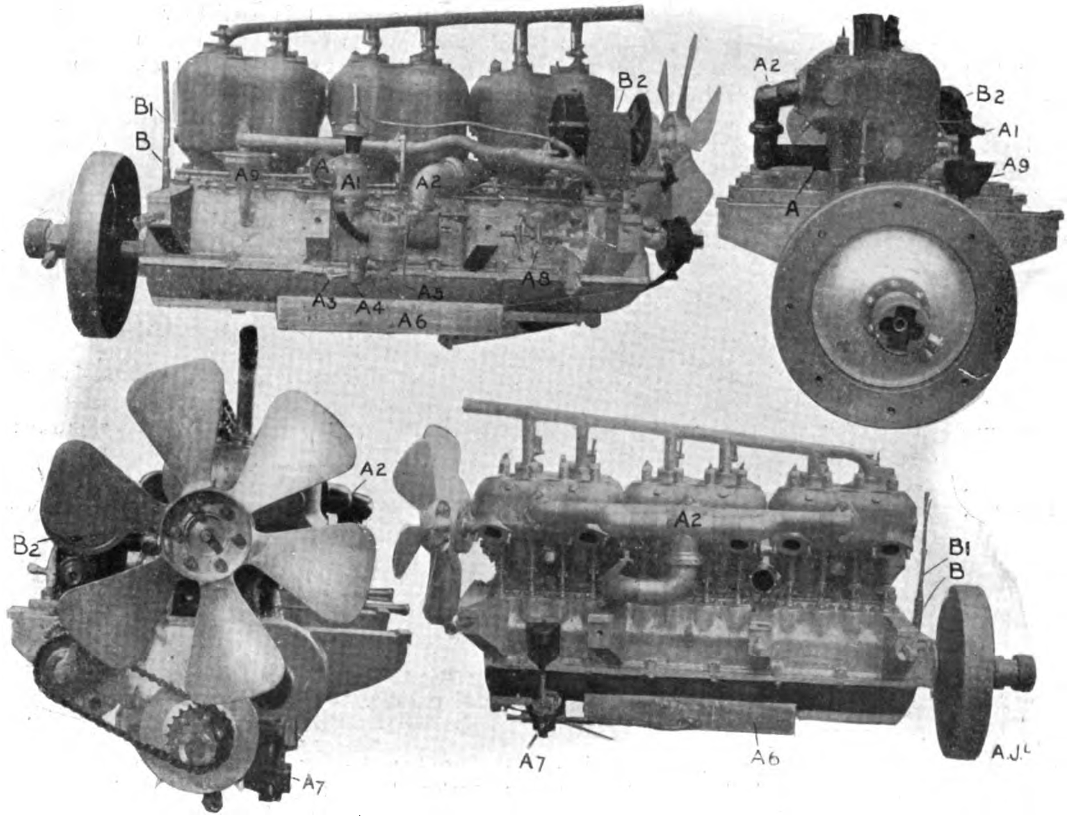

Fig. 3.—Four views of the 60-h.p., 6-cylinder Napier Engine, showing it from each side and from each end. A high-tension magneto, with separate plugs above the exhaust-valves, is fitted to this particular engine as an auxiliary ignition system. The plugs for the usual battery system are similarly placed over the inlet-valves.

auxiliary-air-valve, which can be opened to the required extent by a hand-lever on the dashboard. Very conveniently placed is the carburettor to enable the petrol-cock, A^3, the filter-plug, A^4, and the agitator spindle, A^5 (for "flooding" when necessary) to be got at quite easily, for all these three fittings project through the metal casing that lies beneath the entire mechanism, and can be operated without even raising the bonnet.

Coming now to the lubricating system, which has such a marked effect in saving the driver all trouble and any anxiety, it will be seen that a very large oil-well, A^6, is formed at the bottom of the crank-chamber, and that the pump, A^7, is connected by a short pipe with it. The well can be replenished, whenever necessary, from the large filler, A^9, on the right-hand side of the engine, and this filler is not only large enough to dispense with any additional funnel but has its own gauze-strainer inside it. From the pump, one of the large pipes seen in Fig. 1 leads the oil up into the bottom of a small gauge-glass on the dashboard, while another pipe allows it to pass out again (at the bottom) to the engine. The latter pipe is forked near the carburettor, one arm of the fork leading to a branched pipe that feeds the bearings of the crank-shaft, while the other arm is connected up to a six-way pipe for the cylinders. Each cylinder has a kind of annular trough held in place between it and the crank-chamber, and into this trough dips the piston at the completion of each down-stroke. From the trough, moreover, is a pipe projecting downwards, these pipes directing a stream of oil on to each of the big-end bearings of the connecting-rods, where there is a projecting lip to catch it and direct the oil upon the bearing-surfaces. In the first place, however, the oil is directed upwards by the feed-pipes through which it enters the cylinders, and is therefore injected upon the interior of the piston, and upon the gudgeon-pin. In this manner the oil is circulated continuously, and the driver can yet detect any failure of the pump immediately, if by any remote chance anything should interfere with its action. The gauge-glass on the dash is, of course, completely closed at the upper end, and there is no way in which oil can escape at any point.

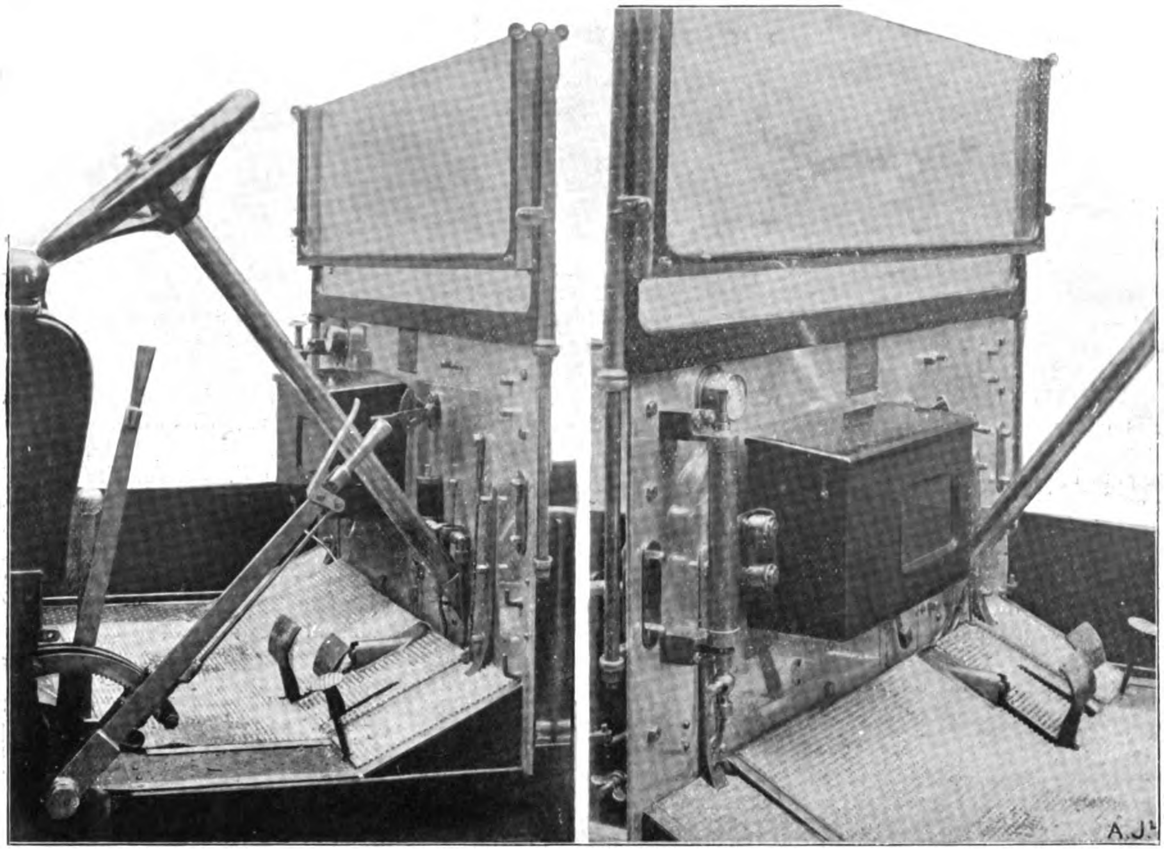

Fig. 3a.—The 60-h.p. Napier Car.—Two views of the dashboard, and of the regulating levers and pedals. On the extreme left is seen the short reversing lever, alongside the change-speed lever and the brake lever, while immediately in front of the driver's seat are the clutch pedal (with its stop), the brake pedal, and the circular accelerator pedal. Centrally placed on the aluminium dash, is the glass-fronted case containing the low-tension commutator, the high-tension distributor and the trembler coil, while to the right of this case are the auxiliary-air lever and the gauge-glass for the lubricating-oil. Beneath the case is the two-way battery-switch, and to the left are fixed the hand-pump for forcing air into the petrol-tank, and the pressure-gauge that is connected to the pressure-feed system. The main switch is fitted centrally above the steering-wheel, the throttle lever and the timing lever working over a quadrant on the wheel.

In Fig. 3A—in the left-hand photograph—this gauge-glass is seen fixed in place, as also are all the other fittings on the dashboard. Above the gauge-glass is the small hand-lever for adjusting the auxiliary-air supply to suit variations of climate or different grades of petrol, and in the right-hand view is seen the hand-pump and pressure-gauge for the fuel-feed system.

(*To be continued.*)

THE G.P.S. PETROL GAUGE.

It is always annoying to have to investigate the contents of a petrol tank by unscrewing the cap and plumbing its depths with a stick in order to ascertain whether there is enough fuel for the projected trip. And yet very few cars are provided with any automatic indication of the petrol level, and remarkably few attempts have been made to introduce any generally adaptable form of gauge. One such—the G.P.S.—has recently come before our notice, however, and this seems to be a *bonâ fide* attempt to supply a useful and reliable commodity. It is extremely simple, as our illustrations show, for it merely consists of a hinged float operating upon a light pointer which moves over a calibrated dial let into the top of the tank. The dial, A, is marked as "full," "½," "¼," and "empty," but the scale could of course be figured in gallons for any particular tank. Projecting down into the tank is a tube, A^1—which is attached to the air-tight case containing the dial—and this holds the spindle, C^1, which carries the pointer, C, at its upper end and the spur-pinion, C^2, at its lower end. Meshing with the pinion, C^2, is the small wheel, B^2, which is connected, as shown, to the rod, C^1, on the end of which is the cork-float, B. As the float rises, it causes the wheel, B^2, to rotate, and this in turn operates, through the pinion, C^2, upon the pointer, thus indicating the level of the petrol on the dial.

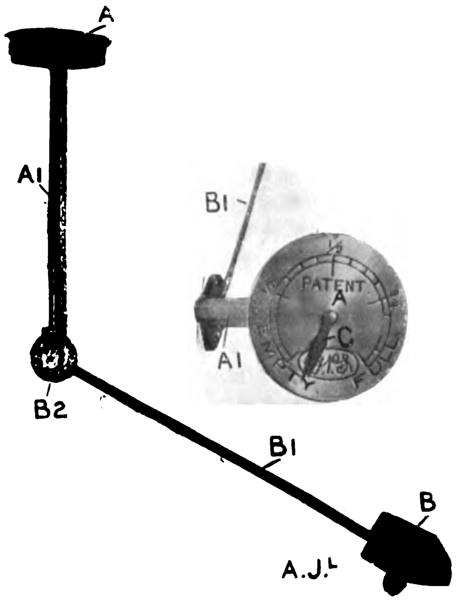

Fig. 1.—The G.P.S. Petrol Gauge. View of the gauge complete, showing the cork float, B. On the right is a view showing the dial, A, with its pointer, C.

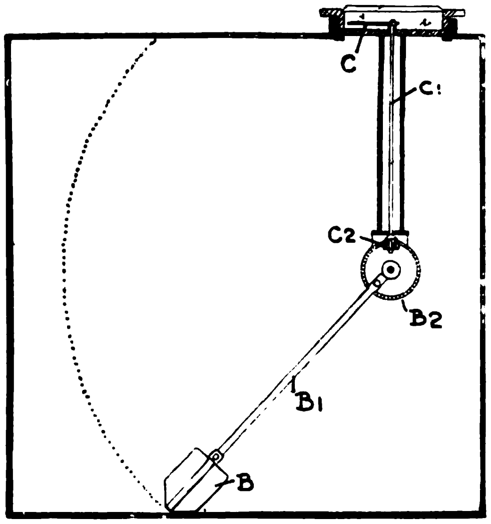

Fig. 2.—The G.P.S. Petrol Gauge. Drawing showing the arrangement of the device in a petrol tank. The dotted line indicates the positions assumed by the float between "empty" and "full."

Except for tanks of a certain shape, the dial should, of course, be specially calibrated, because any given rise of the float does not necessarily represent an equivalent quantity of petrol at all levels in all tanks.

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Laying the Dust not an Unmixed Blessing.

We referred, not long ago, to the deplorable condition, during the wet weather, of the road at Byfleet, where experiments were made last summer with tar as a dust-preventive. We also pointed out that the piece of road at Cobham, which was similarly treated, was also frequently a cause of considerable trouble to the vehicles negotiating it, though, as a matter of fact, it was not nearly so bad as the Byfleet stretch. Other experiments, it will be remembered, of a similar kind were made near Walton-on-Thames, and there things seem to be now rather worse than either at Cobham or Byfleet, for motor cars traversing the mixture of tar, slime, and mud which indicates the portion of road in the Walton district where the tar was employed, seem to be, in consequence of the greasy surface, but very imperfectly under control indeed. A case was recently heard before the Kingston Bench against Mr. J. Ernest Hutton, for exceeding the speed limit on this stretch of road, the summons being ultimately dismissed, presumably on the ground that it was impossible to attain anything like the alleged speed through the shocking "Slough of Despond" which the tar has there produced. But the Chairman of the Bench, who has hitherto certainly been far from favourable to motor cars, made some very drastic remarks on the danger that was now being caused by stretches of road of this kind. He observed that only a short time ago he had seen a motor car skidding owing to the condition of the road surface (the driver being apparently in no way to blame) in such a manner as to very seriously endanger "a nurse and children in a perambulator." Had the car skidded a little farther, the nurse and the children would in all probability have been killed. Mr. Cockburn added that a serious accident would be certain to take place on these pieces of road before long, unless the whole of the material laid down were taken up. It is very unfortunate that the tar, which was so nice during the hot summer months, has proved such a dismal failure during the wet weather.

THE HOFFMANN BALL-BEARINGS FOR MOTOR CARS.—PART II.

Hubs for Live-axle Cars.

FOR cars of the "live-axle" type, one form of hub is made by which the weight of the vehicle is entirely relieved from the revolving shafts that pass through the stationary axle-casing, and another type is also made for vehicles in which the road wheels are fixed rigidly to the ends of the projecting "live" shafts, and these shafts have to take the "load" as well as the "torque." The former pattern is illustrated in Fig. 4, and the latter in Fig. 5.

Referring to Fig. 4, it will be seen that the tubular stationary portion, F, of the axle projects almost through the hub, and that the inner cone portion, B, of the compound ball bearing is fixed securely round it. The portion, B, is internally tapered near one end to fit up against a conical face on the tube, and a split conical sleeve is forced up against a corresponding face inside the other end, by a screwed and locked nut, as seen. The housing, A, that contains the ball-race-members, D, is formed by the hub itself, and these race-members are, as before, secured in place by the threaded collar, A^3, that is locked by the screw, A^5.

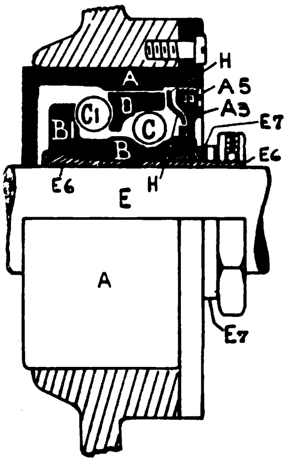


FIG. 6.—Sectional drawing showing the Hoffmann, Single-Compound type of Ball-Bearing.

It will thus be noticed that the ball-bearing is similar to the stationary-axle type, already described, and that it lies in practically the same position in every way. The wheel, however, is driven by the internal "live" shaft, E, by means of an intermediate flexible-coupling-member, E^5, which is held in place over a squared portion, E^2, on the ends of the shaft, by the nut, E^1, and engages, jaw-clutch-fashion, with the hub-casting, A. It will further be noticed that, in this design, the brake-drum, A^6, is made in one piece with the *loose* hub-flange, A^2, and that the entire arrangement is very compact.

Referring to Fig. 5, which is a sectional drawing of the other live-axle type of hub, the upper part is a true cross-section through its centre, and the lower part shows the external portions only in section. In this design, the end of the live-axle, E, passes through the hub, and the external stationary tube, F, that encloses it, terminates in the external shell, F^1, which forms a spherical seating for the ball-bearing. Fixed to the portion, F^1, is also seen the semi-elliptic spring, G, while, beneath it, is the lug, F^4, that receives the usual radius-rod. Similar letters have been used for parts that correspond with those in the other types of hub, although some of these parts differ somewhat in detail. The drawing, taken in conjunction with Figs. 1, 2, and 4, however, clearly demonstrates the precise construction employed.

It will be noticed, in this case, that the bearing is introduced between the revolving axle, E—to which the road wheel is rigidly fixed—and the casing, F^1—that forms a part of the stationary portion of the axle. It will be noticed, too, that the cone, B, of the ball-bearing proper is forced up against a conical shoulder, E^8, on the shaft, E, at the same time that the hub, A^1, of the wheel is locked in place by the nut, E^1. The hub, A^1, itself fits over a square part, E^2, of the axle, but, between it and the cone, B, there is a freely-fitted, split cone, E^4, that has conical faces at each end, and forms a double wedge; in conjunction with the conical shoulder, E^3, the split cone E^4, effectively locks the central portion, B, of the ball-bearing true with the shaft.

In this bearing, the shells, D, fit into a separate housing. A—instead of inside the hub proper—and the collar. A^3, with its locking screw, A^5, are on the outside, instead of the inner side, of it. The casing, A, is moreover mounted so as to be self-aligning inside the other casing, F^1, for there is a spherical socket formed between them, of which the ring, F^2, constitutes the detachable part. The spokes are, of course, bolted, as before, between the fixed flange, A^1—that is formed in conjunction with the brake-drum, A^6—and the loose flange, A^2, into which the dust-proof cap, A^4, is screwed.

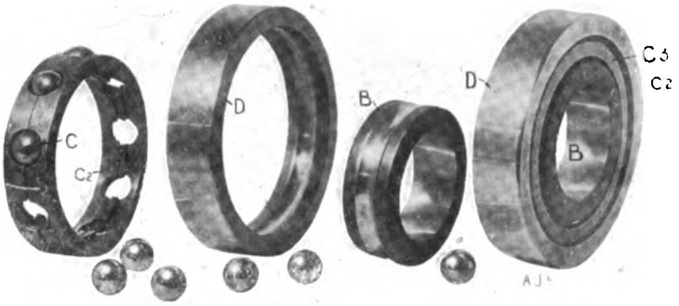


FIG. 7.—Views showing one of the Hoffmann, Single-row, Journal Bearings, complete and in parts.

Other Types of Automobile Bearings.

In certain cases, where two bearings are required on the same shaft, and where the shaft is, moreover, subject to end-thrusts, a type of bearing that has *one* "load-carrying" row of balls and *one* "thrust-taking" row is particularly suitable, and for this purpose the "single-compound" pattern, illustrated in Fig. 6, is manufactured by the Hoffmann Company. The illustration is, for the most part, self-explanatory, in view of our previous descriptions, but special attention should be called to the spring-washer, H, that is introduced between the threaded collar, A^3, and the external race-member, D, that it holds up in place against the balls, C^1, This washer is necessary in order to allow for any expansion or contraction that may take place in the shaft, between the two bearings, and it also compensates for any slight inaccuracy that there may be in fixing the central cone portions of the two bearings the correct distance apart on the shaft.

For use in cases where *no* end-thrust is imposed upon the bearing, a much simpler journal type—having one set of balls only—is employed; the construction of this type is well illustrated in Figs. 7, 8, and 9.

The balls are held apart by a cage, as in the other forms of Hoffmann bearing, and the bearing is made in such a way that the balls can be got into place between the inner and the outer race-members without any kind of "trap-door" arrangement in either race-member, and in spite of both members being solid rings, with their races formed by grooves.

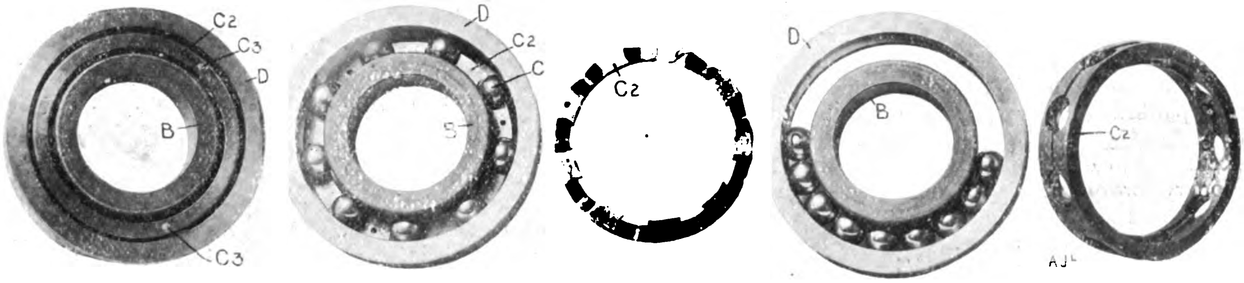


FIG. 8.—Another view of the Hoffmann, Single-row, Journal Bearing, complete and in parts.

In Fig. 7, one of these bearings is seen complete on the extreme right, while to the left of it, successively, are :— the inner race-member, the outer race-member, and the cage. The cage, which is made in two parts, is here seen held together, temporarily, by string passing through the rivet holes, and three of the balls are lying in place in the tapered holes, while the remainder are loose alongside. In Fig. 8 the complete bearing is seen on the left, and the successive views, to the right of it, show it with one half of the cage taken away, show this half-cage separately, show the bearing with the cage entirely removed, and show the cage itself separately, respectively. Fig. 9 is a cross-section, which clearly indicates the shape of the races, and the way in which the balls fit between them. From these illustrations, it will be noticed that although no provision whatever is made for adjustment, the nine balls, C, can be introduced between the inner member, B, and the outer member, D, since they only occupy about a semi-circle, when touching one another, and that the cage —being formed in two pieces—can easily be fitted in place after the balls have been spaced at equal distances apart. The actual faces on the inner and outer race-members are formed by grooves of the shape seen in Fig. 9, so that although the bearing is not intended to withstand any end thrusts, yet it is impossible for any considerable lateral movement to take place between any of the parts. The two halves of the cage, C^2, are subsequently fixed together by the three rivets, C^3, and the cage itself is—as in the other types of Hoffmann bearing, entirely supported and centred by the balls.

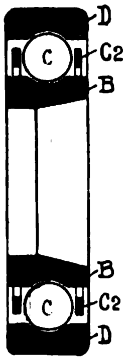


FIG. 9.—Cross Section through the Hoffmann, Single-row, Journal Bearing.

Of the Hoffmann thrust-bearings, comparatively little need be said, since they have been on the market for a considerable period, and also because their construction is in general respects the same as those employed inside the hub-bearings. One of them, however, is shown taken to pieces in Fig. 10, and here it will be noticed that the balls are fitted into the self centring cage, J. The cage is formed by a flat ring, and the retaining holes for the balls are drilled taper, alternately, from the one side and the other. There is a ridge, J^1, on each side of the cage, and this is riveted over sufficiently to prevent the balls from falling out on the side through which they have been subsequently introduced, so that the entire cage with the balls can at any time be removed, and there is no risk of a ball dropping out. The hardened steel thrust collars, J^2— between which the balls run—have the races, J^3, formed by grooves as seen in our illustration, these grooves having a slightly larger curvature than the balls—as in all the other types of bearings.

For fixing the inner race members of any of the "load-carrying" bearings to the shaft, whether it is convenient to machine the shaft specially or not, a variety of forms of construction have been developed by the Company to suit all and every requirement. Where the end of the shaft can be turned with a gradual taper, as in Fig. 3, it is only necessary to tighten the inner cone member, B, up in place by the end nut, E^1, and the bearing is bound to be true. In other cases, a taper is formed partly through the inner member, as seen in Fig. 9, and the bearing can then be fitted over a corresponding taper on the shaft, or a loose, split cone can be forced up between the plain part of the shaft and the bearing, as indicated in Fig. 6; in Fig. 6 there are two loose, split cones, E^6 and E^7, but for some bearings the second one is not needed. In Figs. 4 and 5, other equivalent arrangements are illustrated, the former having a loose, split cone, F^4, forced up by its nut, and the latter having the double-faced conical sleeve, E^4, which is also split, and tightened up by the nut, E^1.

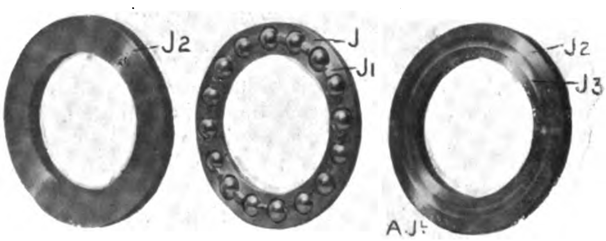


FIG. 10.—View of the Hoffmann Ball-Thrust-Bearing, showing the two Collars that form the Races, and the cage that carries the balls.

Some idea of the various parts of an orthodox petrol car, to which the standard bearings made by the Com-

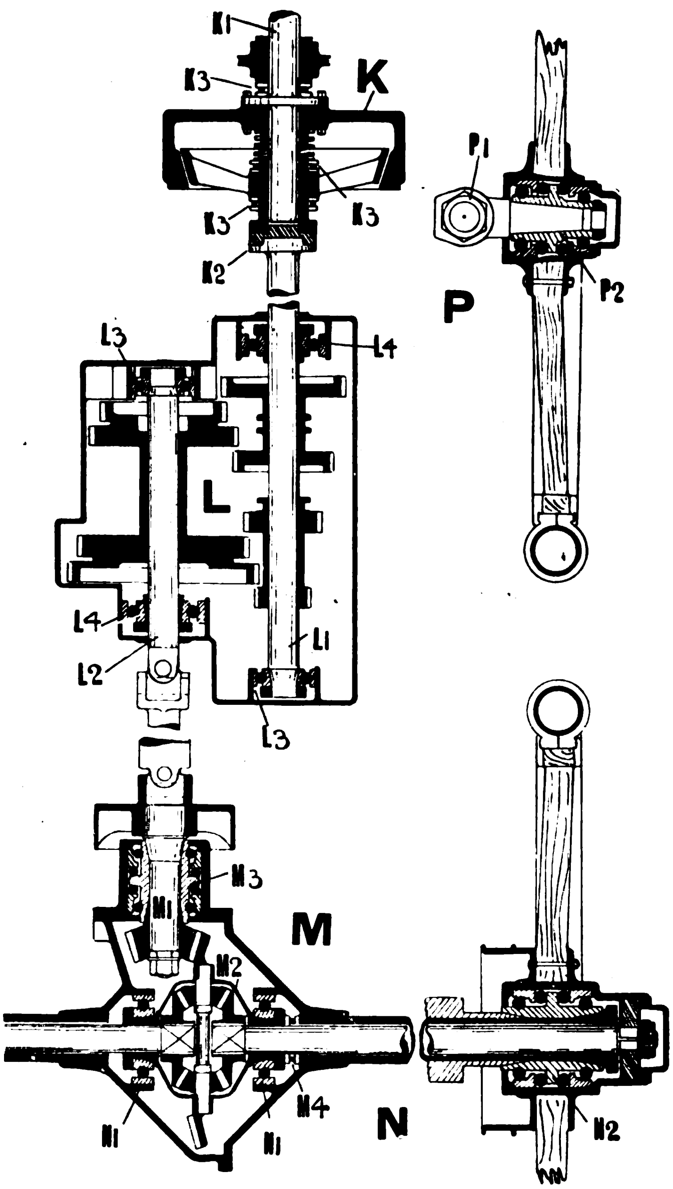


FIG. 11.—Diagrammatic drawing indicating the various types of Ball-Bearing, and the different parts for which they are required, on an ordinary Petrol Car.

pany are applicable, is given in Fig. 11, in which the main clutch, K, the gear-box, L, the bevel-gear, M, the live-rear-axle, N, and one of the front wheels, P, are diagrammatically indicated. For the clutch, K, three thrust-bearings, K^{3}—of the kind illustrated in Fig. 10—are shown, one behind the fly-wheel on the crank-shaft, K^{1}, and the other two on either side of the internal member of the clutch. In this arrangement, a flexible coupling, K^{2}, is supposed to be introduced between the clutch and the first-motion-shaft, L^{1}. The gear-box illustrated is of the type having a first-motion-shaft, L^{1}, and a second-motion-shaft, L^{2}, and it will be seen that both these shafts are fitted with journal bearings of the type illustrated in Figs. 7, 8, and 9; those of the pattern seen in Fig. 6 could, of course, be, to advantage, substituted if required.

The bearing, M^{3}, for the short-shaft, M^{1}—that carries the bevel-pinion driving the differential-gear, M^{2}—is one of the compound bearings, similar to those in the hubs, and the live-rear-axle has load-carrying bearings, N^{1}, of the single-row, journal type on each side of the differential casing, in addition to a thrust-bearing, M^{4}, for taking the end thrust of the bevel-wheel. The bearing, N^{2}, for the driving-wheel is of the type shown in Fig. 4, and the bearing, P^{2}, of the front wheel is of the same pattern as that illustrated in Figs. 1, 2, and 3, this wheel being carried by the stub-axle, P^{2}, that projects from the steering-head, P^{1}.

Some General Considerations.

Although it has been demonstrated beyond all question that they are eminently well suited for motor car construction, there are quite a number of points in connection with the design, manufacture, and use of ball bearings which are of very great importance to ensure their successful employment, particularly when they either have to run at a high rate of speed, or are subjected to heavy loads. First and foremost, special attention may be drawn to the fact that, in the Hoffmann bearings, the load is taken by each ball race at right angles to the axis of rotation of the balls, and that no spinning, or other imperfect rolling action, can therefore take place.

At one time it was the usual practice to design ball bearings in such a way that more than two points of contact were obtained against each ball, and it was also considered necessary that means should be provided for adjusting the inner and the outer races relatively to one another. Experience has shown, however, that it is practically impossible to make the balls run properly (without spinning or skidding) if there are more than two points of contact, and that heating, at high speed and under load, is likely to occur with them. By considering a simple case of a thrust bearing of the four-point ball type, such as that shown diagrammatically in Fig. 12, some of the reasons why four-point ball bearings of all kinds are unsatisfactory can perhaps be most easily explained. In this illustration—which is a section of only one half the bearing—*a*, *b*, indicates the axis of the shaft, and *c* is the central point on that axis from which the lines drawn to *d* and *e* ought, as shown, to pass through the four contact points of the races with the balls. Theoretically, such a bearing as this should work satisfactorily. As a matter of fact, however, it is found in practice that very rapid wear takes place, the reasons apparently being that the "give" in the balls, when in use, causes their track on the race to become a strip of perceptible width, instead of only being a mathematical line, and that apart from this it is practically impossible to grind the races so exactly true as to ensure the four contact points falling precisely on the lines *c*, *d* and *c*, *e*. Another very serious objection—which is also applicable to load carrying, as well as to "thrust," bearings of this character—is that the balls are subjected to compound strains internally, which they are

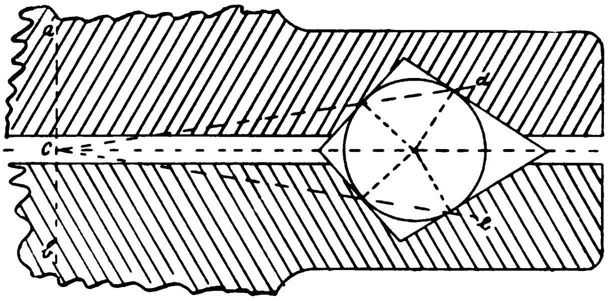


FIG. 12.—Diagram of an old-fashioned Ball-Thrust-Bearing of the Four-Point-Contact Type.

apparently unsuited to withstand. It will be noticed, for instance, in Fig 12, that each race has a wedge action tending to crush the balls, in addition to the other pressure exerted upon them, between race and race.

Although a simple "load-carrying" bearing of the two-point type may be capable of withstanding a certain amount of end-thrust on the shaft, and—from the nature of those made by the Hoffmann Co.—they are capable of doing so, yet it is obviously a questionable practice to utilise them in this way, since the points of contact may then cease to be precisely opposite one another on radial lines from the shaft, and compound strains are also set up (by the wedging action) in the balls. It is for these reasons that the Hoffmann compound bearings have been introduced, and it is, moreover, particularly noticeable in them that the inner rows and the outer rows of balls tend to keep each other true in their respective races, so that there is no undue wear imposed upon the balls by rubbing or chafing against the sides of their tracks.

Of the advantages obtained by the use of proper cages there appears to be but little question, since otherwise the wear and tear caused by the balls rubbing against one another is very perceptible, and it may almost be taken as an axiom that ball-bearings are useless if any wear takes place at all. The cages not only separate the balls in this way, but they also compel all the balls to follow the same track, whether they are actually taking the load at the time or not, apart from the convenience that it is to be able to dismantle a bearing without risk of the balls falling out. The cages themselves do not appear to be subject to any material wear, if properly made, and when designed as they are by the Hoffmann Co., they are automatically rendered self-centring by the balls.

As a result of considerable experience, the Hoffmann Co. recommend the use of a very thick oil in the bearings, but they regard it as a protection from moisture and rust rather than as a lubricant, pure and simple. The cones and shells, which are made of a steel that is specially prepared for the purpose, are annealed and hardened in such a way that the surface is rendered dead hard, but that the interior still remains extremely tough. Needless to state, the success of these bearings is to a great extent due to the accuracy attained by the Company in the manufacture of the balls themselves, since even the best designed bearing would soon be ruined if one single ball were slightly untrue, or were of a different size to the rest; an inaccurate ball would have to take the whole weight, unaided by the others, would damage the races, and, if too large, would render impossible any proper initial adjustment of the bearing.

Table of Reference Letters for the Hoffmann Ball-bearing Illustrations.

"Load" Bearings.

A	External casing containing shells, D.
A^1	Flange forming part of hub.
A^2	Detachable hub flange.
A^3	Threaded collar retaining shells, D, in place.
A^4	Hub cap.
A^5	Locking screw for A^3.
A^6	Brake drum
B	Central cone portion.
B^1	Flanged portion of B.
C	Balls in outer (load-carrying) races.
C^1	Balls in inner (thrust) races.
C^2	Retaining cages for balls.
C^3	Rivets for cage in single row bearing.
D	Shells forming external ball-race members.
E	Rear axle.
E^1	Nut for fixing hub to axle.
E^2	Squared portion of live rear-axle.
E^3	Conical shoulder of live-rear-axle.
E^4	Sliding conical wedge sleeve of live-axle.
E^5	Flexible coupling block.
E^6	Split conical fixing sleeve.
E^7	Split fixing cone for same.
F	Stationary tube enclosing live-axle.
F^1	Casing fitted to ends of tube, F.
F^2	Removable portion of spherical bearing
F^3	Lug for radius rod.
F^4	Split fixing cone.
G	Semi-elliptic carriage spring.
H	Spring washer.

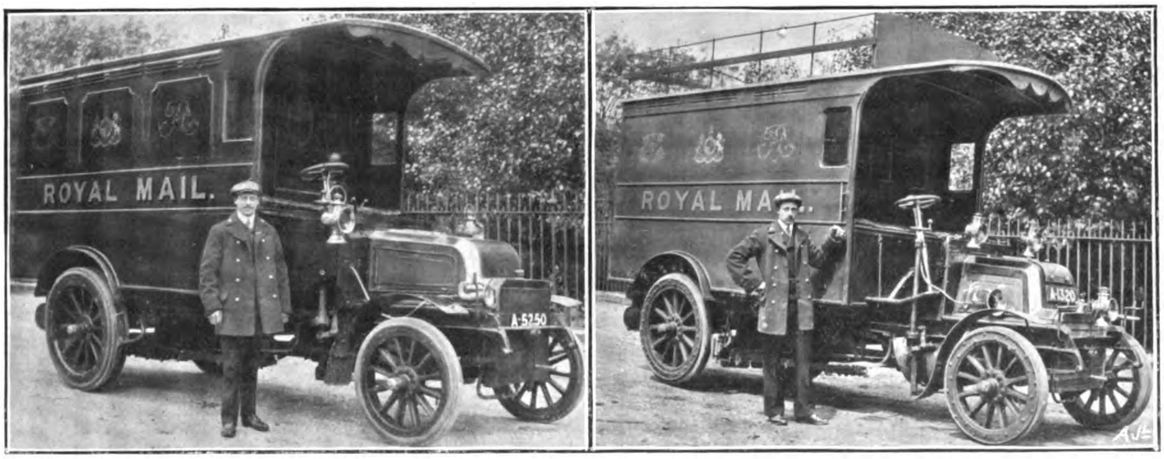
Thrust Bearing.

J	Cage for thrust bearing.
J^1	Projecting ridges on same.
J^2	Thrust collars.
J^3	Grooves forming races in same.

Diagrammatic Drawing of Car.

K	Main clutch.
K^1	Crank-shaft.
K^2	Coupling between clutch and gear.
K^3	Thrust bearings.
L	Gear-box.
L^1	First-motion shaft.
L^2	Second-motion shaft.
L^3	Single row bearings at ends of shafts, L^1 and L^2.
L^4	Ditto encircling the shafts, L^1 and L^2
M	Bevel-gear mechanism driving differential.
M^1	Short longitudinal shaft.
M^2	Differential gear.
M^3	Compound bearing for shaft, M^1.
M^4	Thrust bearing for bevel-wheel.
N	Live axle
N^1	Single-row journal bearings for same.
N^2	Compound hub bearing for driving-wheel.
P	Front road wheel.
P^1	Steering-head.
P^2	Compound hub bearing.

* * * *



The 20-h.p. Van.

The 12-16-h.p. Van.

A pair of Milnes-Daimler Royal Mail Vans, which have accomplished respectively 23,000 miles (20-h.p. van), and 30,000 miles (12-16-h.p. van), both of these distances being completed on October 31st, 1905. The former van will complete two years' regular running in April next, and the latter three years in March. The service has been carried out by Mr. G. H. Hayes, of Plumstead, who, as contractor, is running these vehicles for the General Post Office. As will be remembered, we gave particulars in May 1903, upon the occasion of the May Day gathering on the Thames Embankment, of Mr. Hayes's official work for the Post Office. Mr. Hayes informs us that during the entire time these vehicles have been running, the only repair has been one connecting-rod bearing.

THE 4 AND 6-CYLINDER QUESTION.

THAT which is most sought after by engineers whose business it is to construct engines, is—apart altogether from considerations of mechanical detail—the acquisition of even torque. It is this steadiness of turning moment which chiefly characterises the electric motor, and the turbine; and it is this same merit that is being aimed at by those designers who are adopting six, and even eight cylinders, instead of a lesser number, for petrol engines. There is no more satisfactory method of comparing the theoretical advantages, in the matter of torque, between various engines than by graphic diagrams, and those which we have received from Mr. S. F. Edge—that keenest of keen champions of 6-cylinder construction—afford an interesting comparison between single, 4 and 6-cylinder engines.

For the purpose of forming a basis, indicator diagrams were taken from a standard 40-h.p. 6-cylinder Napier engine, and the typical diagram shown in Fig. 1 has been derived from them. The curves show the variations in pressure which take place during the cycle (four

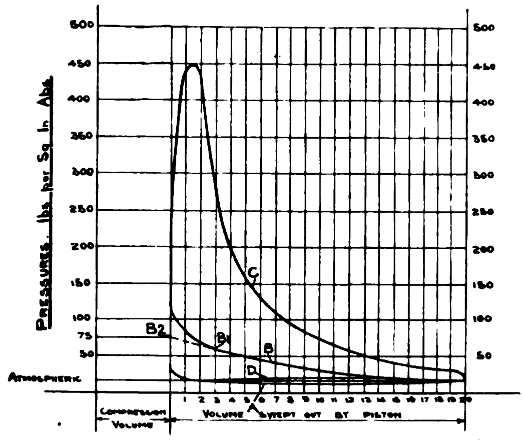


FIG. 1. INDICATOR DIAGRAM.

MEAN EFFECTIVE PRESSURE 82 LBS PER SQ INCH

CYLINDER - 4 IN BORE 4 IN STROKE 1700 R.P.M.

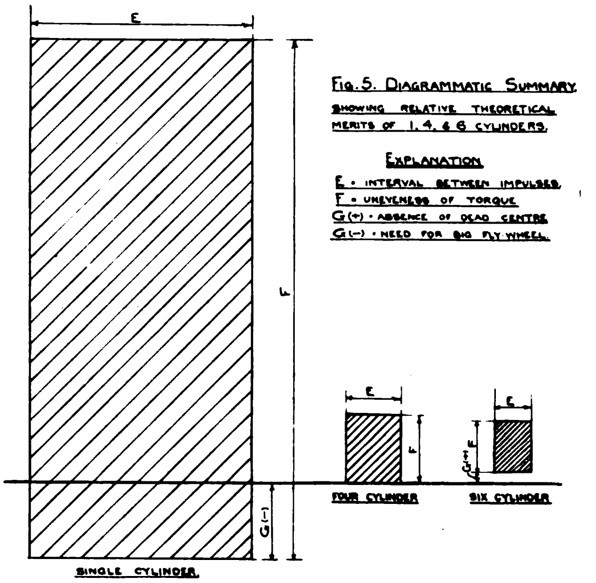


FIG. 5. DIAGRAMMATIC SUMMARY

SHOWING RELATIVE THEORETICAL MERITS OF 1, 4, & 6 CYLINDERS.

EXPLANATION

E = INTERVAL BETWEEN IMPULSES

F = UNEVENESS OF TORQUE

G(+) = ABSENCE OF DEAD CENTRE

G(−) = NEED FOR BIG FLY WHEEL.

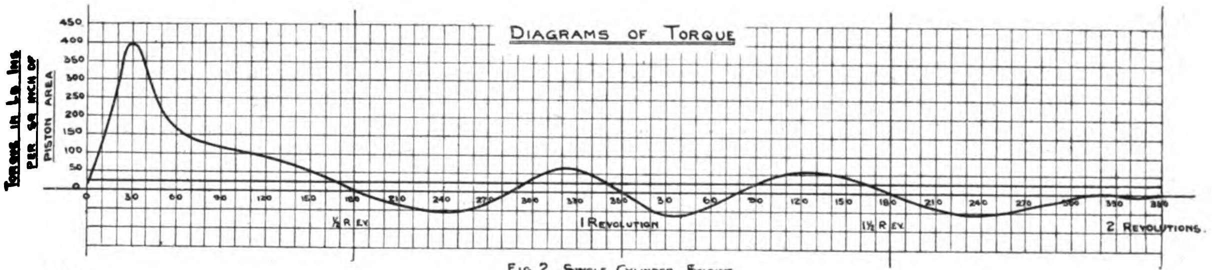


FIG. 2. SINGLE CYLINDER ENGINE.

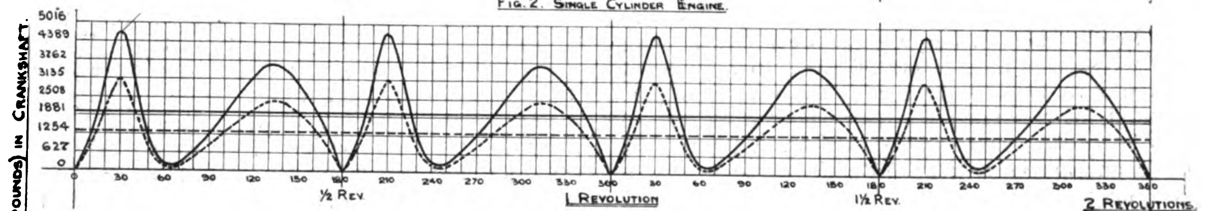


FIG. 3. FOUR CYLINDER ENGINE.

—— ENGINE SAME POWER AS SIX-CYLINDER IN FIG. 4. - - - - - ENGINE WITH CYLINDERS OF SAME SIZE AS SIX-CYLINDER IN FIG. 4.

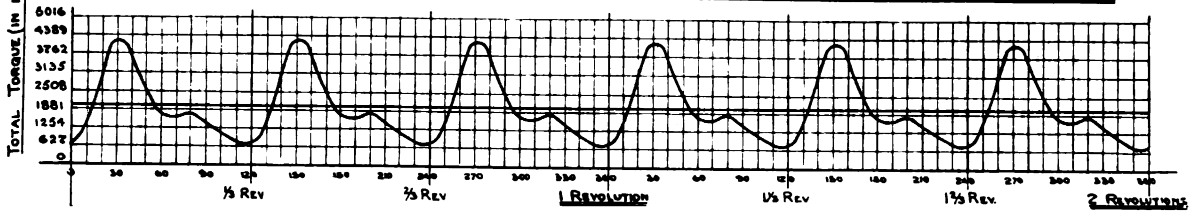


FIG. 4. SIX CYLINDER ENGINE.

Diagrams analysing the relative evenness and intensity of turning moment between 1, 4, and 6-cylinder engines. Fig. 1 is an ordinary indicator diagram which acts as a basis for the torque diagrams in Figs. 2, 3, and 4. Fig. 5 is a summary expressing, in an easily understood graphic form, the results shown in detail in the other figures.

successive strokes) of one cylinder. The suction-stroke is represented by the line, A, slightly below the atmospheric line (14·7 lbs. per sq. in.), it is followed by the compression line, B, which would normally continue to B^2, if ignition—occurring at B^1—did not cause the pressure to rise just before the end of the stroke. Slightly after the piston has passed its dead-centre, the explosion reaches its maximum force of 450 lbs. per sq. in. (absolute), which, on a piston of 4-in. diameter (12·56 sq. ins. area) is approximately equivalent to a blow of nearly 2½ tons. After this the gas expands as the piston travels outward on its working stroke, C, and the burnt gases are finally discharged to atmosphere during the exhaust stroke, D. It has been mentioned that a pressure of nearly 2½ tons is applied to the piston of a 6-cylinder Napier engine when developing 40-h.p., but in a 4-cylinder engine of the same cylinder capacity and stroke this blow would be proportionately greater (nearly 3¾ tons), and in a single-cylinder engine it would reach the enormous value of about 14 tons.

Even when applied to a single-cylinder engine, an ordinary indicator diagram does not convey, except to those who have made a special study of the subject, any lucid idea of the variation of *torque* in the crank-shaft, although it shows the fluctuations of *pressure* behind the piston. This is chiefly due to the fact that the reciprocating parts (chiefly the pistons) are travelling at constantly varying velocities. The result is that they alone require a considerable amount of power to overcome their inertia during the first half of each stroke, and that they similarly transfer an equal amount of power to the crank-shaft, owing to their momentum, during the second half of the stroke. It is, therefore, only at each dead centre, and at approximately midway points between, that the net torque on the crank-shaft is unaffected by them. Their effect has consequently to be added to, or deducted from, that of the varying pressure behind the piston, and this fact entirely alters the comparative aspects of an indicator diagram and a torque curve ; this will be shown more fully presently. It will, of course, be understood that, in practice, the fly-wheel tends to equalise the strains on the transmission shafts on a car, and that it is the fly-wheel which maintains an equal angular velocity of the crank-shaft.

For a single-cylinder engine these changes are graphically illustrated in Fig. 2. All the forces tending to twist the shaft in the "positive" direction are plotted above the zero line, all those which are negative (*i.e.*, which tend to stop the engine) are plotted below the line. These changes take place successively throughout the cycle, and in Fig. 2 they are drawn out in sequence over one long base line, portions of which are marked off to represent equal intervals in the cycle. Similar curves have been drawn, with Fig. 2 as a basis, in Figs. 3 and 4 to represent the torque variations in a 4 and 6-cylinder engine respectively. In Fig. 3 the dotted line represents a 4-cylinder engine having cylinders of the same size as the 6-cylinder shown in Fig. 4, but the full line gives the real comparison since it has been drawn to represent a 4-cylinder engine of the same power.

It is not difficult to understand how these diagrams have been constructed from Fig. 2 as a basis, for the torque of a 4 or a 6-cylinder engine is merely that of an equivalent number of single-cylinder engines superimposed at the correct intervals on the same crank-shaft. Thus the curves in Figs. 3 and 4 have been obtained by superimposing the curve in Fig. 2 upon itself in such a way as to correctly represent the relative firing positions of the individual cylinders in each of those engines. These curves are then "added" together, and only the resultant curves are actually shown in Figs. 3 and 4.

These resultant curves show evenness of torque, but in order to summarise them in a more graphic manner for the benefit of those of our readers who are not interested in the "mathematics" of the subject, we have prepared the simple rectangular diagrams shown in Fig. 5. From these rectangles—which have been constructed entirely from the curves compiled by Mr. Edge—the relative theoretical merits in the matter of torque (between engines of similar power) can be compared, from three distinct points of view, at a glance. The height, E, of each rectangle denotes the relative *un*evenness of the twisting moment in the crank-shaft, and the widths, F, of each rectangle represent the relative time interval elapsing between each periodic impulse. It will be noticed that the rectangle representing the 6-cylinder engine is smaller in both these dimensions, which indicates that the magnitude of the change in torque is less, and that the frequency with which that change takes place is greater—both of which contribute to steady running.

More important, in proportion, than either of these dimensions, however, is the distance, G(+), of the 6-cylinder rectangle above the zero line, because this indicates that the torque is always positive, that there is no dead centre and no need, theoretically, for any fly-wheel in order to keep the engine running. In the case of the 4-cylinder engine it will be noticed that it touches the line, and the theoretical fly-wheel need, therefore, only be infinitely small to enable the engine to run at all, whereas with the single-cylinder engine there is a considerable portion of the diagram, G (–), below the line, which indicates the absolute necessity for a comparatively large fly-wheel.

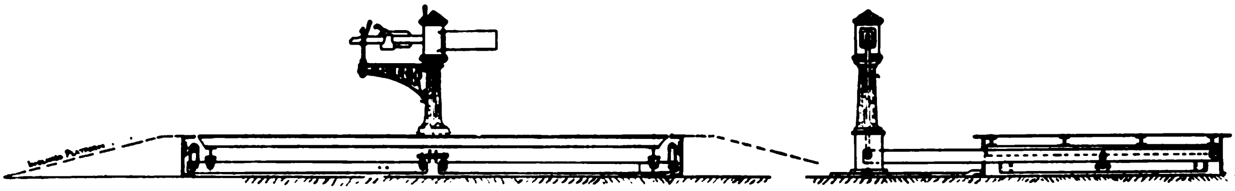
All these points are, of course, discernible in detail in Figs. 2, 3, and 4, but, as we have remarked above, they may not be obvious to the lay mind. One of the most interesting points to be noted is the positive increase in torque which occurs in a 4-cylinder engine during the second third of each stroke. After an explosion the torque naturally falls off rapidly, and owing to the effect of the other pistons it becomes nearly zero after the crank has passed through 60 degrees of revolution. At this point, however, the torque is suddenly increased again — this time by negative work alone — and actually attains a large proportion of its maximum value. This is not due, it must be remembered, to another explosion — which only occurs at the beginning of each stroke — but to the curious effect of the other pistons. It is better understood by considering one or two other interesting points which are very marked in Fig. 2. Thus, instead of the torque remaining reactionary throughout the exhaust stroke, it actually changes over to a forward direction merely because of the momentum of the retarded piston. Similarly with the suction-stroke, which is shown in the first half of the second revolution, the curve crosses the line for the same reason, while even the compression-stroke—which, it would be imagined, should finish with a large reactionary turning effort—hardly indicates any negative torque at all, the momentum of the pistons almost overcoming the compression.

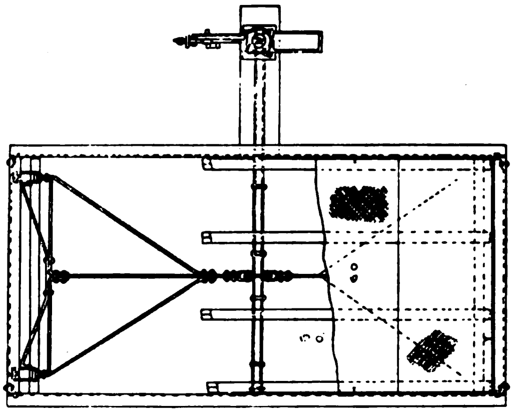
It is the interaction of these effects which produce the interesting—and at first sight surprising—leading feature of the curve in Fig. 3, with its eight apparent impulses, and it is these eight rises of the positive torque that largely explains the known virtues of the 4-cylinder engine.

A SPECIAL WEIGHBRIDGE FOR MOTOR CARS.

Two particularly useful features have been secured in a new weighbridge that the well-known Birmingham firm of weighing machine specialists—Messrs. W. and T. Avery—have recently introduced. It is self-contained, in the sense that it needs no expensive foundations, and can be simply laid down in place anywhere on level ground, and it is so constructed that it is practically portable—can be easily taken to pieces and re-erected by any ordinary workman.

No individual part exceeds 500 lbs. in weight, and yet the steel platform is 12 ft. long by 6 ft. wide, while the machine has a capacity of 5,000 lbs. The working parts are, moreover, completely enclosed, and every part is of ample strength to withstand the maximum strains to which it is likely to be exposed.





Our illustrations give a good general idea of the appearance and construction of this very useful machine, and it will there be noticed that, when erected, the only additional work involved, before it is ready for actual use, is that of building wooden inclined approaches to enable the car to mount the platform; the platform, which is made in five sections, is but 12 inches above the ground, and therefore this is but a very simple matter.

The pedestal is securely fixed to the girder framework and is provided with a self-registering steelyard, which not only enables the weight to be read off by the operator but also prints a permanent record on a ticket at the moment of weighing. Needless to say, this machine is exceptionally well made in every respect, with hardened steel knife-edges and ample bearing-surfaces, and it is almost equally superfluous to add that each weighbridge is most carefully calibrated, and is tested to its full capacity, before leaving the works.

For use in connection with automobile contests of all kinds, such a machine is unquestionably a great improvement over many of the rough-and-ready devices that have been resorted to on certain occasions of this nature in the past, and we have no doubt that there are many other instances in which motorists will find such a machine invaluable.

* * * *

AERONAUTICS.

Deutsch-Archdeacon Competition.

THE rules for the Deutsch-Archdeacon "Heavier-than-Air" Competition, to which we referred on October 8th, 1904, when the Prize was first offered, comprise the following stipulations :—

1. Any type or size of apparatus may compete, provided it does not rely for its suspension on any gas which is lighter than air, nor have any material connection with the ground during its flight.
2. Those desiring to make a trial must notify the Aero Club de France.
3. Each entrant must send a fee of fifty francs before he makes his trial. The entry fee is not returnable ; it covers all trials made by the entrant during one day only.
4. Notification of a trial must be made in time for the Aero Club officials to be advised on the previous evening at latest. Should the trial ground be far distant from Paris the notification must be sent in earlier than this.
5. Trials will be only recorded between sunrise and sunset.
6. The committee reserve the right of refusing to officially observe a trial if the *bona fides* submitted to them are not considered to give sufficient evidence of extensive private experiments. On this point their decision is final.
7. Only one entrant may make trials during one day. If there are more entries, the others must compete on successive days, following the first.
8. Entrants must specify the starting and turning points, which must be separated by at least 500 metres.
9. Trials must be held in France, and if conducted outside a radius of 40 kiloms. of Paris the competitor must bear the expenses of the official observers.
10. Trials may only take place in the presence of the club officials. The "start" will be considered to occur when the machine ceases to touch the ground. If the experimenter does not wish to alight on returning, he must drop some object on the ground within a radius of 25 metres of his starting point.
11. The club officials may take any steps for the general safety, but are, nevertheless, not responsible for accidents.
12. The Prize may be competed for within 5 years from 1st October, 1904.

A Letter from the Wright Brothers.

THE rumour to which we referred last week, that a French syndicate, represented in the United States by Mr. Arnold Fordyce, had concluded an agreement with the Wright Brothers for the purchase of their invention and their first machine, appears to be well founded. The negotiations have apparently been concluded, and both Wilbur and Orville Wright have written to M. F. S. Lahm, of the Aero Club de France, the following letter :—

"We have received your last letters, for which we thank you. We have just signed a contract with Mr. Arnold Fordyce, representing various personages in Paris, to give the option to purchase our first machine for the French Army. We have received a letter from the management of the 'National Society of Commerce' of another European country, which, having heard of our offer to sell to the French Government for a million, is anxious to acquire an option, on the apparatus, being anxious to present the apparatus to its Emperor on the occasion of a National *fête* at an early date. Our French contract prevents us from giving an exclusive option at once.

"Our motor is very satisfactory as regards regularity and power, but weighs considerably more than the French motors of the same output. Still we shall be able to double the weight of our motor without experiencing any difficulty in flight. We have never made any particular attempt to attain extreme lightness, neither as regards the motor or to the other fittings, but we have directed our efforts towards obtaining solidity and the highest possible 'efficiency.' It is proved that we have been able to alight over and over again without the slightest injury to our apparatus. We think our motor is fairly efficient, as it consumes less than a pound of gasolene per horse-power hour. We have not as yet formed any views regarding its commercial exploitation, because we hope to be sufficiently remunerated without doing so."

Thus it would seem that the French Army is to reap the first benefits of the Wrights' ingenuity and pluck. It will not be altogether creditable to the United States if this proves to be so, but perhaps the historian will look upon it as a return for favours bestowed in the past. America largely owed its independence to Lafayette, and the Irish regiments in the French service. That it is returning past benefits by thus placing its most recent discovery at the military service of France, will, after all, only be a *quid pro quo.*

Santos Dumont Adopts the Aeroplanes.

AMONG the secondary results of the revelations which have been extorted from the Wright Brothers, may be counted the decision M. Santos Dumont has embraced with some suddenness of, if not abandoning the navigable balloon type of airship, betaking himself to experiments with machines of the aeroplane type. We understand that he is already having a machine built to compete for the Deutsch-Archdeacon Prize, which, however, is not at all like that used by the Wright Brothers, as it is understood to be furnished with two vertically-acting propellers on the top, which perform the lifting functions, while a horizontal propeller in front is to produce motion in the forward direction, the gyrations of the machine being regulated by a suitable tail. So far, we do not gather that any actual experiment with a machine of this type has been made, and opinions, to say the least, differ as to the value of the vertical propellers as soon as forward motion has commenced. However, we shall see what we shall see, and in the meantime the suggestion, together with the proposal for the Polar expedition, effectively keeps M. Santos Dumont before the public of Paris and the world generally.

Are His Proposals justified by Experience?

THIS announcement of the determination of M. Santos Dumont to accomplish the conquest of the air *and* the Deutsch-Archdeacon Prize at one swoop by means of a "helicopterous" flying machine, has excited considerable attention among several French aeronauts, by some of whom it has apparently been taken quite seriously. An example is provided by M. Archdeacon, who expresses himself as very sorry to learn that M. Santos Dumont seriously proposes to adopt the helicopterous arrangement rather than the aeroplane which, in M. Archdeacon's opinion, provides much the best chances of success. The term *helicoptere* has been employed to designate a type of flying machine appearing in the patent records of most European countries, in which reliance is placed on vertical-lifting propellers revolving in a horizontal plane to provide the ascensional force. M. Archdeacon points out that the efficiency of propellers arranged in this way as regards lifting — though lifting can be apparently effected by their means if sufficient power is put into them—is extremely bad, and that the stability of a machine when proceeding to move through the air fitted in this way is more than problematic. In addition, the extra motive power, the provision of extra propellers that are necessary on the helicopterous principle, and the transmission mechanism to them, all involve great increases of weight as compared with the motor-driven simple aeroplane. M. Archdeacon has gone through a number of calculations as to the minimum safe weight for all these appliances, and he differs a good deal in his results from M. Santos Dumont. While the maximum weight which M. Santos Dumont calculates his machine, including the aeronaut, will amount to is 160 kilogs., M. Archdeacon reckons 212 kilogs. as the minimum possible if the machine is to hold together. As the calculated ascensional force which the arrangement of propellers and motor of M. Santos Dumont is proposing amounts altogether to 180 kilogs., if M. Archdeacon's calculations are correct the machine will fail to rise in the air owing to an excess of its weight over its lifting power of some 32 kilogs. Upon the whole we are inclined to agree with M. Archdeacon. We do not say that M. Santos Dumont will not effect something. What he will effect the future alone can show. But we simply do not believe in the lifting propeller principle, one among our many reasons being that forcibly advanced by M. Archdeacon, that the stability of such an arrangement is highly questionable, no means for restoring equilibrium, if it is once upset, being apparent. In addition to this, no one knows in the least what effect advancing forward through the atmosphere will have upon the lifting power, torque, and other characteristics of the lifting propellers. It seems at any rate quite certain that the surface they cover cannot be looked upon in the same way as an equivalent surface of aeroplane. M. Archdeacon points out, and it is a tremendously trenchant observation, that there is a substantial agreement in design between all the machines that have really raised themselves from the ground and flown any distance, either with or without an aeronaut. They have all relied upon surfaces to sustain them in the air, propellers merely to push them forward, and on the vertical component produced by the action of the air encountered by the aeroplane, for vertical lift in the air; mechanically, at any rate, this would seem to be far the most efficient method to adopt. We make these observations simply because we believe that where the experience obtained by experimenters working quite independently of one another all converges towards the same conclusion, it is a conclusion which at any rate is entitled to the highest respect. Of course, nobody can really foresee what genius and determination will effect, and none will be more ready than ourselves to congratulate M. Santos-Dumont should he succeed in proving that the methods adopted hitherto of tackling the problem are not the only ones which can lead to success; at present, however, all the indications seem to point in the opposite direction. That the aeroplane has the power to lift itself, and, according to its size, one or more operators as well, has been proved to the hilt. It is controlling and managing it that present the difficulty, and constitute the appeal which it makes to the element of skill. It is impossible to avoid the misgiving that those who pin their faith on the lifting propeller do so rather because they feel that there is something that will hold them up no matter what happens. Vertical propellers, in fact, represent to them the gas-bag of the navigable balloon. . . . But, where is the security if the motor should stop suddenly?

A Holland Idea.

M. SANTOS DUMONT'S change of attitude is not the only strange result which the publication of the Wright Brothers' performances has produced. It is reported by a London morning paper that Mr. J. P. Holland, known as an inventor of submarine boats, who has previously declared his interest in aeronautical problems, has undertaken to fly from his office in New York to his residence in New Jersey in March next. The details furnished in regard to the machine he proposes to use are calculated to excite the hilarity of those who have studied the subject even superficially. Mr. Holland proposes, it is stated, to employ four silken wings 20 inches long and 18 inches wide at the tip. They are to be worked by foot pedals like an ordinary bicycle, presumably by a chain drive. If wings of these dimensions are capable of raising Mr. Holland in the atmosphere, he must be a more than usually ethereally constructed inventor. Needless to say such a machine would be absolutely inadequate as a Pegasus for even the flimsiest poet of the Postlethwaite school. We are reluctantly forced to the conclusion either that Mr. Holland has been having some fun with the reporters, or that the reporters have been having some fun with him.

An Aerial "Bicycle."

AMONG the many alleged inventors of new flying machines, "there is another Richmond in the field," with an arrangement which appears to somewhat resemble that of Mr. Submarine-boat Holland. The motive power is to be provided in much the same way by treadles worked by the aeronaut (not necessarily the inventor). Of course, bamboo, aluminium, and silk are the main substances employed, and the machine is ridden down an inclined road till it attains the necessary impetus to soar up into the air. A clutch, we are then informed, comes into play. Whether this means that the aeronaut clutches for the ground to steady himself, or not, is not explained, and the machine, we are told, is driven with about the same amount of exertion as is involved in riding an ordinary bicycle, an amount which, as most people will be willing to admit, varies considerably. No data, disputed or otherwise, are to hand as to what this inventor has actually accomplished.

More Encouragement for Aeronauts.

BY way of inspiring further efforts on the part of aeronautical inventors, M. Deutsch de la Meurthe has announced a new competition, under the auspices of the Aero Club of France, endowed with valuable prizes. The following are the conditions of his offer:—

1. The prize may be competed for with machines either heavier or lighter than air.
2. The circuit will be a minimum of 200 kiloms., with a turning point, designated in advance, distant 100 kiloms from the start.
3. The prize itself will be a trophy valued at 10,000 francs. The winning club will be holder.
4. In addition, a money prize of 20,000 francs will be given to each of the three first competitors who win the Cup; for which the trials will be annual.
5. The detailed rules will be drawn up later by the Aero Club de France in consultation with M. Deutsch de la Meurthe.

A Military "Flyer."

CAPTAIN FERBER, of the French Army, is likely to be a competitor for the Deutsch-Archdeacon Prize for heavier than air machines.

* * * *

CLUBS AND ASSOCIATIONS.

A.C.G.B.I.

THE annual general meeting of the Automobile Club takes place on March 8th at the Club House, 119, Piccadilly.

Marine Motor Association.

AT a Council meeting, held on the 11th inst., Mr. J. I. Thornycroft's proposal that a fixed piston speed be assumed, instead of revolutions, in motor power calculations, was further discussed. Mr. F. R. S. Bircham submitted figures obtained from measurements taken last year, and owing to the variations in these, it was felt that it would be impossible to assume a fixed piston speed which would be fair to all motor builders.

Mr. Linton Hope's resignation of the honorary secretaryship was accepted with regret, and he was elected to a vacancy on the Council.

Motor Yacht Club.

THIS organisation has published a somewhat lengthy *resumé* of its year's work. Over one-third of the whole article is a verbatim extract from the judges' report on the Reliability Trials, which we published at the time of its issue, and the remainder enumerates in somewhat less detail the other events of the season.

Yorkshire A.C.

THE annual meeting of the club takes place on January 26th at 8 p.m., in the G.N. Hotel, Leeds, the club headquarters. A special general meeting, convened for the purpose of dealing with the affiliation question, will precede the annual gathering at 7 p.m.

Free Admission to Exhibitions for Motor Union Members.

MEMBERS of the Motor Union will be admitted free of charge, on production of their Motor Union tickets of membership for 1906, to the following Motor Car Exhibitions:—

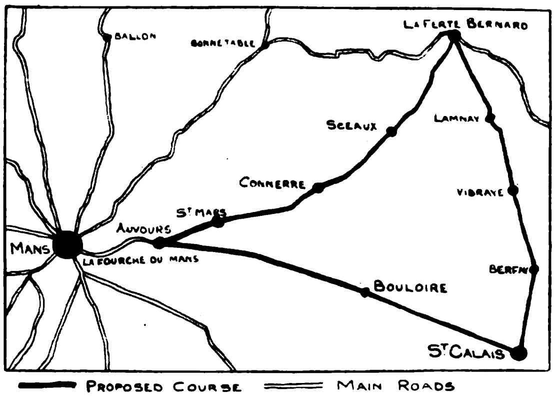
Birmingham (Bingley Hall), January 19th to 23rd.
Newcastle (new Exhibition Hall), February 9th to 17th.
Manchester (St. James's Hall), February 23rd to March 3rd.
Glasgow (Exhibition Hall), March 9th to 17th.

The Motor Union ticket of membership is, in effect, a season ticket for these important provincial Exhibitions, and may be utilised as frequently as the holder thereof may desire to visit them.

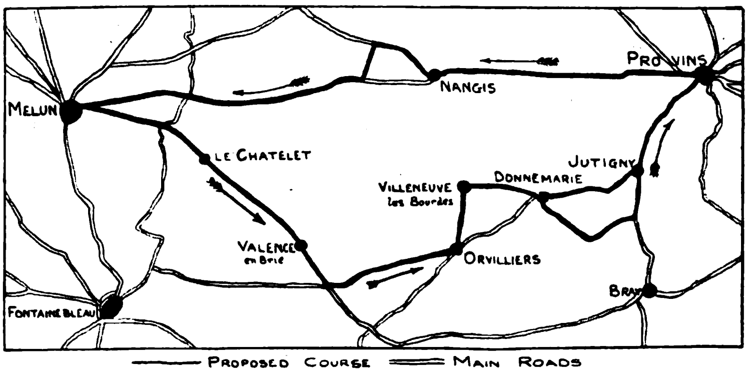
Radiators for Petrol Cars.

IN a very comprehensive paper on the subject of radiators for motor cars, read before the Institution of Mechanical Engineers (Graduates' Association) on Monday of last week, Mr. F. E. Bennett gave some interesting figures. Speaking of radiators of the finned tube type, he stated that 3 sq ft. of cooling surface per h.p. was about the usual allowance on petrol cars to-day when a fan is used in connection with them, or about twice that surface with no fan. The surface of the fins should, he thought, be at least four times, but not more than six times, that of the tubes themselves. Speaking of the reduction of temperature effected in an ordinary radiator, he had found that the temperature of the water was lowered by about 30 degrees to 50 degrees F., and on the subject of the quantity of water passed through the system per h.p. developed, he mentioned 10 to 15 galls. per hour as being the customary limits. As regards the quantity of heat taken up by the jacket from the cylinders, he fixed from 25 to 35 per cent. of the total heat available as being approximately the usual figure. The greater portion of the paper was occupied in reviewing the various types and systems in use, and in a consideration of many of the constructional points connected with their manufacture.

RACES, RECORDS, AND TRIALS.



The Sarthe Circuit.—The Selected Course.



The Brie Circuit.—The Second Favourite.

"GRAND PRIX" RACE OF THE A.C. DE FRANCE.

The 1906 Scottish Reliability Trial.

THE Scottish Reliability Trial, organised by the Western Section of the Scottish Automobile Club, has now been definitely fixed to take place on 13th, 14th, 15th, and 16th June next. There will be some variation on last year's route, which it is thought will extend the interest and value of the Trial. It is proposed that a portion of the south of Scotland will be included, and that the classification on this occasion shall be by price.

The Grand Prix Course.

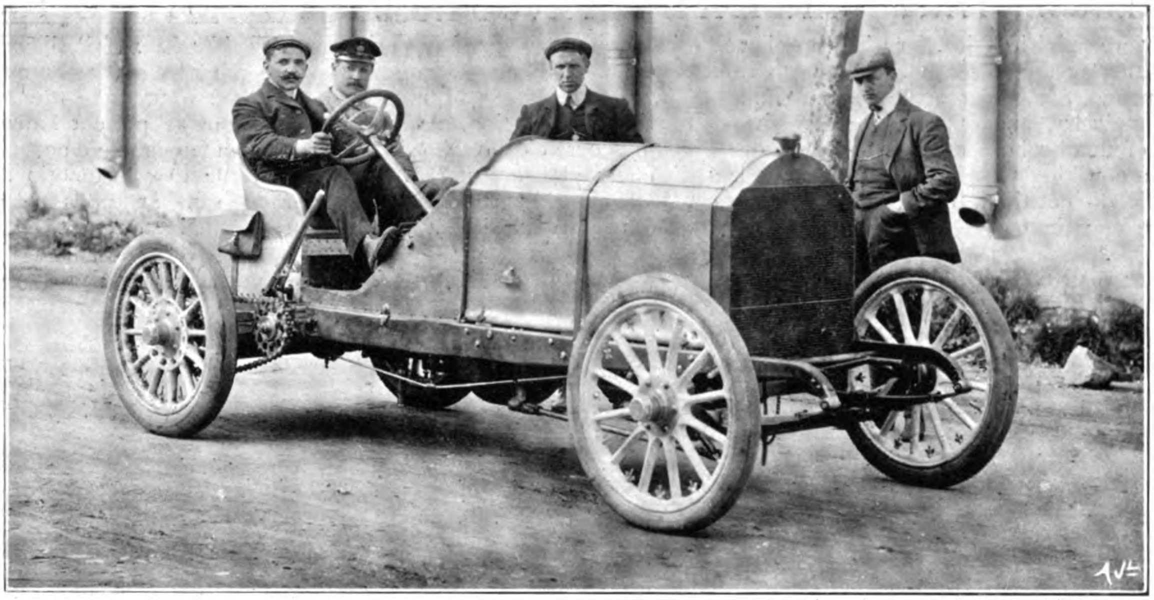
ONE by one the numerous courses suggested for the big French race have been voted unsuitable by the A.C. de France Sporting Commission. The only two left in the balance last week were the Sarthe and the Brie Circuits given above. The former is near Le Mans and is about 100 kiloms. in length. It forms an almost perfect equilateral triangle between the points La Ferté-Bernard, Auvours and Saint-Calais. The latter is triangular in character, but is somewhat irregular on two of its sides. Last week we gave the extreme points of this, starting from Melun. The variations suggested were to branch off to the left, short of Montereau, to Orvilliers, and then go north to Villeneuve and on to Donnemarie, Jutigny, and Provins, *viâ* Longueville, thence, as before, back to Melun.

The final decision was taken on Tuesday, when the Sarthe Circuit was the one selected. Many points in its favour have turned the balance. It is within three hours of Paris, and very convenient for railway service at several points. There is only one level crossing, viz., at St. Calais, and of the 100 kiloms. 80 are practically straight roads. Finally, the town of Mans is contributing 100,000 francs to the organising fund. The lengths of the three sides of the triangle are:—La Fourche—St. Calais, 34 kiloms.; St. Calais—Ferté Bernard, 31½ kiloms.; Ferté Bernard—La Fourche, 34½ kiloms. One of the suggested points for the start is at La Fourche, another near Ferté Bernard.

An important innovation is recommended by the Sporting Commission, in accordance with our statement last week, viz., *that the race shall extend over two days*—probably about 600 kiloms. per day—with the right to change conductors on the second day. This recommendation is mainly in view of the nature of the circuit, which will give exceptional opportunities for high speed, and by reason of the new rule permitting only the driver and mechanician to change and repair tyres. Three only were against the two days' proposition, viz., MM. Loysel de Turckheim and Brasier. Of course, the final decision rests with the A.C. de France Committee, where no doubt the matter will be again thrashed out strenuously.

Ormond-Daytona Beach Meeting.

COMMENCING on Monday next, this annual Florida race meeting will be continued during the whole of the week. A splendid programme of events has been arranged, and we anticipate further sweeping successes from Clifford Earp and his 6-cylinder racing Napier, the only British racing car taking part in the races. Wonderful stories are flying around in regard to a new machine which has been secretly constructed in America for Mr. A. G. Vanderbilt. The h.p. of this monster is given variously at 125 to about 500-h.p., and such "gentle" speeds as 150 miles per hour are confidently mentioned. As we announced months ago, Sartori, the clever Italian driver, has been selected to drive this machine. Many of the leading crack Continental cars, which have all manner of "records" to their credit, are amongst the entrants, and we may therefore expect to have some startling speed announcements cabled during the coming week. Hemery, whose marvellous achievement on the Ostend road on a 200-h.p. 8-cylinder Darracq racer we recently recorded, will be present to uphold his world's record. In addition to the 8-cylinder car, three other racers have been shipped for the Florida Meeting, including the 80-h.p. Darracq which successfully carried Hemery to victory in the Circuit des Ardennes and Vanderbilt Cup races, the Darracq Voiture Légère and the Voiturette. The Darracq Company will therefore be competing in the three classes—heavy weight, middle weight, and light weight, as they are termed in America. It was at first thought, we are informed, that these cars would be unable to compete at the Florida Meeting owing to the North German Lloyd Steamship Company, after almost promising to take the cars by their ss. "Kaiser Wilhelm II.," cabling at the last moment that they were unable to accept them. The Darracq Company, it appears, had offered this line a big sum if they would allow the "Kaiser" to open her hatches and pick up the cars at Cherbourg or Southampton, these ports being reserved for passengers only



An interesting picture of the three well-known racing drivers, Messrs. Gabriel, Duray, and Rougier, who have all been "annexed" for this year's racing by Baron de Turckheim, head of the De Dietrich firm. The De Dietrich Company are taking a prominent part in the big events of 1906, including the A.C. de France "Grand Prix," the Targa Florio, the Brescia and Ardennes Circuits, and the Vanderbilt Cup. The car in our photograph is a 120-h.p. De Dietrich racer; Gabriel is at the wheel, Duray is in the background, and Rougier is by the front wheel.

on this line. However, by cabling to America and securing a special express train for the cars and men from New York to Florida—a trip that takes two and a half days, and will cost £400—it was found possible to bring the cars through England and ship by the ss. "Majestic" from Liverpool. This will enable the racers, it is hoped, to arrive at Florida the day before the meeting commences. As the Darracq Company say, this does not leave much time to tune up their cars, which will have been at the mercy of the wind and waves of the stormy Atlantic for six days.

An Illustrated Racing Calendar.

It is proposed by the A.C. de France to issue annually an illustrated calendar of sporting events, which is to be sold at two francs a copy. Each notification of a meeting to the A.C. de France, must be, it is suggested, accompanied by a deposit of, for the first event, 500 francs, for the second, by the same organisers, 300 francs, and 100 francs per meeting for any further events. These deposits will remain as a charge against the sale receipts for the books when published.

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MOTOR BOATING.

The Blue Ensign.

The Motor Yacht Club has been granted the privilege by the Admiralty of flying the Blue Ensign of His Majesty's fleet on all registered vessels belonging to members of the club.

Naval Motor Boats.

At the suggestion of the A.C. de France, the French Minister of Marine is organising a competition for motor-driven boats suitable for use in the French Navy and general coast service. Such boats are to have engines of about 165 to 200-h.p., which must be either of the flash-steam type or oil engines using heavy oil, and must also be capable of starting from cold and developing half their full power within 10 minutes. Separate prizes are offered for the best engines (10,000, 8,000 and 6,000 francs), and for the best hulls (3,000, 2,000, and 1,000 francs), and the motor manufacturers have no choice in the matter as to which of the hulls (submitted by boat-builders) their engines shall be fitted into. Fuel power is to be developed by the engines at a speed of 500 to 600 r.p.m. The hulls are to be of wood, of between 17 and 20 metres in length, and a speed of at least 12 knots is to be maintained.

MOTOR CYCLING.

Land's End to John o' Groat's.

Interest is growing in this important trial, which the Auto-Cycle Club propose holding in the interests of the motor cycling industry during the coming season. It is thought that 300 miles per day for three consecutive days will prove too severe a strain for the drivers, and the suggestions which find favour are that the trial should extend over four or six days, with a day's rest in between the long distance rides. This would serve two purposes, by giving the riders a little breathing time, and enabling the competing machines to be on exhibition to the public at some important towns where the halt for the night would be made.

International Cup Race.

The course for this race, fixed to take place on June 29th, has been selected in South Bohemia. British support in enabling the Auto-Cycle Club to be adequately represented at the event is urgently needed. It is to be hoped that manufacturers, assisted by patriotic amateurs, will enter a goodly number of machines to compete for the honour of upholding British interests in the Eliminating Trials in the Isle of Man next May.

"Multi-Cylinder Engines for Motor Cycles."

Under the above title, Mr. B. Chatterton will read a paper before the members of the Auto-Cycle Club, probably next month. Mr. Chatterton, who is a member of the committee, has had considerable practical experience with a motor bicycle fitted with a 4-cylinder engine.

Quarterly Trials, January 20th.

For this 100 miles trial on the Oxford Road there are 19 entries.

PARLIAMENTARY CANDIDATES FAVOURABLE TO AUTOMOBILISM.

BELOW we publish a list, for which we have to thank the courtesy of our contemporary, *The Car*, of Parliamentary candidates at the present election who have frankly expressed views favourable to the progress of the automobile movement. Altogether some 400 intending M.P.'s are in favour of measures calculated to promote the benefit of the industry, and opposed to repressive or restrictive legislation. Of course we do not at present know how many of those whose names appear on our list will secure election, but in any case it is a favourable omen that so many are willing to adopt, and more or less distinctly pledge themselves, to favour the new locomotion. We certainly do not think that anything like 400 candidates would have been willing to do the same at the last election, and we may therefore hope that automobilism will receive fair, if not generous, treatment in the next House of Commons.

Our readers will, of course, understand that most of the candidates will have either been elected or put out ot the running by the time the present number of THE AUTOMOTOR JOURNAL is in their hands. The list will, however, prove valuable for future reference when automobile legislation is before the House of Commons.

London.

Battersea—J. Burns, A. S. Benn.
Bermondsey—H. Cust.
Bethnal Green—F. Ridley, H. S. Pickersgill.
Bow—A. du Cros.
Chelsea—F. J. Horniman.
Clapham—Percy Thornton.
Croydon- A. Forster, Somers Somerset.
Deptford—Alderman Bowerman.
Dulwich—Dr. R. Harris, David Williamson.
Fulham—W. Hayes Fisher.
Greenwich—Lord H. Cecil, J. H. Benn, R. S. Jackson.
Hackney—A. H. Allhusen.
Hammersmith—Sir W. J. Bull.
Hampstead—J. S. Fletcher.
Harrow—T. Gibb.
Hoxton—Hon. C. Hay, H. Ward.
Islington—W., F. H. Medhurst; S., Sir A. Rollit; E., G. H. Radford.
Kensington—S., Earl Percy.
Lambeth—N., Major H. Gastrell.
Limehouse—Sir H. S. Samuel.
Maryiebone—E., Lord R. Cecil; W., Sir S. Scott; W., Sir H. Johnston.
Mile End—H. W. Lawson, B. S. Straus.
Poplar—Sydney Buxton.
Rotherhithe—C. Macdona.
St. Pancras—N., E. R. Moon; E., Sir T. Wrightson.
Strand—Hon. W. F. D. Smith.
Stepney—Sir Evans Gordon.
St. George's, Hanover Square—Hon. H. Legge.
Wandsworth—Sir H. Kimber.
Wimbledon—St. S. L. Fox-Pitt.

Boroughs.

Bedford—P. Barlow.
Barrow—Sir C. Cayzer.
Birmingham—E., Sir Benjamin Stone.
Boston—W. Garfit.
Brighton—E. A. Villiers.
Bristol—S., W. Long, W. H. Davies; N., J. A. Foote, A. Birrell; W., G. A. Gibbs, T. J. Lennard; E., C. E. Hobhouse.
Bury St. Edmunds—Capt. F. Hervey.
Canterbury—J. Henniker Heaton.
Carlisle—F. W. Chance.
Chatham—Major E. Jameson.
Cheltenham—T. Agg-Gardner.
Chester—R. Yerburgh, A. Mond.
Christchurch—Major K. Balfour.
Colchester—Sir W. Pearson.
Coventry—J. Kenneth Foster, A. E. W. Mason.
Darlington—H. P. Pease, I. Mitchell.
Derby—E. Spencer Churchill.
Devonport—Hudson Kearley, Sir J. Jackson.
Dover—G. Wyndham.
Exeter—Sir E. Vincent.
Gravesend—Sir G. Parker.
Halifax—Sir S. Crossley, J. H. Whiteley, J. Parker.
Hartlepool—Sir C. Furness.
Hastings—F. Freeman Thomas, H. du Cros.
Hereford—J. S. Arkwright, Col. Scudamore.
Huddersfield—T. Woodhouse, J. Foster Fraser.
Hull—W., C. H. Wilson; Central, Sir H. S. King.
Hythe—Sir E. Sassoon.
Ipswich—F. T. Cobbold.
Kidderminster—S. Baldwin.
Leeds—S., A. W. Fox, Sir J. L. Walton; W., H. Gladstone, S. Samuel; Central, G. W. Balfour.
Liverpool—Abercromby, Major Seely; Exchange, C. McArthur; Scot., T. P. O'Connor; Kirkdale, D. McIver; Toxteth, R. Houston; Everton, J. S. Harwood Banner.
Maidstone—Sir F. Evans, Lord Castlereagh.
Manchester—E., T. G. Horridge, A. J. Balfour, R. Armitage; N.W., Winston Churchill, W. Joynson Hicks; S., L. E. Smith.
Middlesbrough—Sir S. Sadler.
Newcastle—W. Hudson.
Northampton—Dr. G. Shipman, F. Gorell Barnes, T. R. Cairns.
Nottingham - W., J. H. Yoxall; S., Lord H. Bentinck.
Preston—Sir W. Tomlinson, J. Kerr, H. Cox.
Plymouth—T. W. Dobson, H. E. Duke, H. G. Smith.
Portsmouth—A. Whitelaw.
Reading—Rufus Isaacs.
Salford—W., Sir Lees Knowles; S., H. Belloc.
Salisbury—Sir W. Palmer.
Scarborough—C. E. Hunter, W. R. Rea.
Sheffield—Central, Sir H. Vincent; Hallam, C. S. Wortley; Attercliffe, A. Muir Wilson.
Southampton—J. Aird, T. Chamberlayne.
Stafford—C. E. Shaw.
Stalybridge—J. Travis Clegg.
Stoke-on-Trent—D. H. Coghill.
Stockport—J. Duckworth.
Sunderland—T. S. G. Pemberton, D. A. Haggie.
Tynemouth—F. Leverton Harris.
Uxbridge—Sir F. Dixon-Hartland.
Warwick—A. Lyttelton, T. H. D. Berridge.
Wednesbury—A. Bird.
Winchester—Hon. G. Baring.
Windsor—J. F. Mason.
Wolverhampton—S., Henry Norman; W., Sir A. Hickman.
York—J. G. Butcher, H. Greenwood.

Universities.

Oxford—Sir W. Anson.
Cambridge—Sir J. Gorst.
Edinburgh—J. St. L. Strachey.

Counties.

Beds—Biggleswade, Lord A. Compton.
Berks—E., Lord Haddo.
Bucks—N., P. F. Fremantle; Aylesbury, Hon. W. Rothschild.
Cambridge — Chesterton, W. Raymond Greene, E. S. Montagu; Wisbech, T. C. Garfit; Newmarket, C. D. Rose.
Cheshire—Macclesfield, W. B. Davenport; Crewe, J. Tomkinson, J. Hugh Welsford; Knutsford, Hon. A. T. Egerton; Eddisbury, Col. C. Jodrell; Northwich, Sir J. Brunner, C. L. Samson; Wirral, W. H. Lever.
Cornwall — Bodmin, H. B. Grylls; St. Austell, W. McArthur; Launceston, T. Fletcher Moulton.
Cumberland — Eskdale, C. W. Lowther, Hon. G. Howard; Penrith, J. W. Lowther; Cockermouth, Sir W. Lawson, Sir J. Randles; Egremont, Capt. E. Lumb.
Derbyshire — Repton, J. Gretton, H. Raphael; Worksworth, Hon. V. Cavendish.
Devonshire—Tiverton, Hon. L. Walrond; Torquay, F. Leyland Barret; Barnstaple, W. E. Horne.
Dorsetshire—Bridport, Col. Williams; Dorchester, T. Scarisbrick; Poole, C. Lyell, C. van Raalte; Shaftesbury, Sir Randolf Baker.
Durham—Chester-le-Street, Sir J. Joicey; Bishop Auckland, J. M. Paulton; N.W., A. Jones; S.E., Hon. F. W. Lambton.
Essex—Romford, L. Sinclair; Epping, Col. M. Lockwood; Saffron Waldon, J. A. Pease; Chelmsford, Sir F. Carne Rasch; Walthamstow—W. J. Shard.
Gloucester—Cirencester, Hon. A. Bathurst; Tewkesbury, Sir M. Hicks-Beach; Forest of Dean, Sir C. Dilke; S. Glos., E. Colston.
Hants—Basingstoke, A. F. Jeffreys; Petersfield, W. G. Nicholson, H. Money-Coutts; New Forest, H. Compton; Fareham, A. H. Lee; Isle of Wight, Colonel H. Morgan.
Herefordshire—Leominster, Sir J. Rankin; Ross, Col. A. Gardner.
Hertfordshire—St. Albans, Col. W. Carlisle; Watford, N. Micklin.
Huntingdon—S., J. Cator; Ramsey, Hon. A. Fellowes.
Kent—Sevenoaks, H. W. Forster; Tonbridge, A. G. Boscawen, A. P. Hedges; St. Augustine, A. Akers Douglas; Thanet, H. H. Marks; Medway, Col. C. Warde.
Lancashire—Eccles, Dr. Pollard; Chorley, Lord Balcarres; Lonsdale, Hon. R. Cavendish; Rossendale, L. Harcourt; W. Houghton, Lord Stanley; Stretford, C. A. Cripps; Gorton, E. F. G. Hatch; Southport, E. Marshall Hall; Ormskirk, Hon. A. Stanley; Leigh, J. F. Brunner; Widnes, Sir J. Swinburne; Blackpool, W. W. Ashley.

Leicester—Melton, Sir A. Hazelrigg; Bosworth, Sir C. McLaren; Loughborough, M. Levy, W. B. Du Pre; Market Harborough, Hon. P. Stanhope, C. H. Dixon, R. C. Lehmann.
Lincolnshire—Lindsey, K. E. Moreing, Major L. Renton; Horncastle, Lord Willoughby de Eresby; Kesteven, Hon. H. Chaplin; Holland, H. R. Mansfield, E. M. Pollock.
Middlesex—Ealing, Arthur Hutton; Harrow, Hon. W. Peel.
Monmouthshire—Chepstow, Major C. Morgan.
Norfolk—S.W., Sir Thomas Hare.
Northumberland—Tyneside, J. Knott; Berwick, Sir E. Grey.
Nottingham—Mansfield, A. B. Markham.
Oxfordshire—Woodstock, G. H. Morrell.
Shropshire—Oswestry, A. H. Bright, W. C. Bridgeman; Newport, Col. Kenyon Slaney; Wellington, C. Henry, H. Harmsworth; Ludlow, R. Hunt.
Somerset—Wells, R. E. Dickinson, T. B. Silcock; Wellington, Sir A. A. Hood, Dundley Ward; North Somerset, W. Peake Mason, W. Bateman Hope; Bridgwater, R. A. Saunders; Shepton Mallet, B. G. Falle.
Staffordshire—Kingswinford, A. Staveley-Hill, Hon. F. Guest; Handsworth, Sir H. Meysey-Thompson, R. S. Leon; Pankridge, H. D. McLaren, Sir A. Henderson; Burton, R. T. Ratcliffe.
Suffolk—Sudbury, Sir W. Quilter; Woodbridge, Captain E. Pretyman; Stowmarket, Hon. W. Guinness.
Surrey—Reigate, Capt. H. Rawson, H. C. Brodie; Wimbledon, E. Hambro, St. George L. Fox-Pitt; Chertsey, Lord Bingham; Guildford, Hon. St. J. Brodrick; Epsom, W. Keswick.
Sussex—Horsham, Lord Turnour, L. Erskine; Chichester, Lord E. Talbot; Eastbourne, Sir Lindsay Hogg, H. Beaumont; E., Dr. Hutchinson, G. L. Courthope, Sir F. Milner; East Grinstead, W. M. Crookshank.
Warwick—Stratford-on-Avon, P. S. Foster; Rugby, C. Pennant, R. Peel.
Westmoreland—Kendal, Major Bagot, Dudley S. Smith.
Wiltshire—Chippenham, Sir J. Dickson-Poynder; Westbury, Lord Dunsany, J. M. F. Fuller; Wilton, Lieut. A. Morrison.
Worcester—Droitwich, C. Harmsworth; N., T. W. Wilson, W. Campion; E., J. Morgan, A. Chamberlain.
Yorkshire—Holderness, A. S. Wilson; Thirsk, Lord Helmsey; Richmond, Earl Ronaldshay; Pudsey, G. Whiteley; Elland, C. Trevelyan, Sir T. Brooke Hitching; Keighley, W. M. Acworth; Sowerby, J. S. Higham, W. Hinchcliffe; Rotherham, Sir W. Holland; Doncaster, Sir F. Fison; Barnsley, J. Walton; Morley, A. E. Hutton; Colne Valley, Sir J. Kitson; Skipton, R. F. Roundell; Howdenshire, Harrison Broadley, P. Benson; N.W., A. Billson.

Wales.

Cardiff—Sir F. Flanery, Hon. I. Guest.
Carmarthen—Hon. V. Ponsonby.
Carnavon—D. Lloyd-George.
Flint—Eldon Bankes, H. Edwards, Howell Idris.
Glamorgan—Thos. J. Williams, Col. Wyndham Quin.
Swansea Town—Sir G. Newnes.
Pembroke—A. Saunders Davies, Gen. Pole-Carew, Randal Mainwaring.
Merioneth—A. Osmond Williams.

Ireland.

Antrim—Chas. Craig.
Armagh—Col. S. Saunderson.
Kilkenny—P. O'Brien.
Louth—T. M. Healy.
Monaghan—Dr. E. Thompson.
Westmeath—Donald Sullivan.

Scotland.—Boroughs.

Aberdeen—N., Capt. D. Pirie.
Ayr Burghs—W. Younger.
Dumfries—Sir R. Reid.
Edinburgh—W., Sir L. McIver; S., A. Dewar.
Glasgow—Bridgeton, C. S. Dickson, J. W. Cleland; St. Rollox, T. Mackinnon Wood; Blackfriars, A. Bonar Law; Tradeston, A. C. Corbett, D. M. Mason.
Glasgow College—Sir J. Stirling Maxwell, H. A. Watt.
Hawick—Sir Conan Doyle, T. Shaw.
Kirkcaldy—J. H. Dalziel.
Leith—R. Munro Ferguson.
Stirling—Marquess of Graham.

Counties.

Aberdeen—A. Maconochie.
Argyll—T. S. Ainsworth.
Ayr—N., Hon. T. Cochrane; S., W. B. Beale.
Berwick—H. J. Tennant.
Buteshire—N. Lamont.
Caithness—R. L. Harmsworth.
Clackmannan and Kinross—K. Clyde.
Dumbarton—Col. H. Brock, T. D. White.
Edinburgh—Lord Dalmeny.
Fife—H. Asquith.
Forfar—Capt. Sinclair.
Haddington—R. Haldane.
Inverness—J. A. Dewar.
Kilmarnock—T. A. MacIntyre.
Kincardine—S. T. Cammel.
Lanark—Govan, H. S. Murray; N.W., C. Douglas, W. M. Thomson; S., W. Menzies.
Linlithgow—A. Ure.
Perthshire—T. R. Buchanan, Marquess of Tullibardine.
Renfrewshire—Sir M. Stewart, R. Laidlaw, J. Cunningham, Sir T. Coates.
Roxburghshire—Sir G. Waldie Griffith.
Selkirk—Master of Elibank.
Sutherland—F. Leveson-Gower.
Wigtonshire—Lord Dalrymple.

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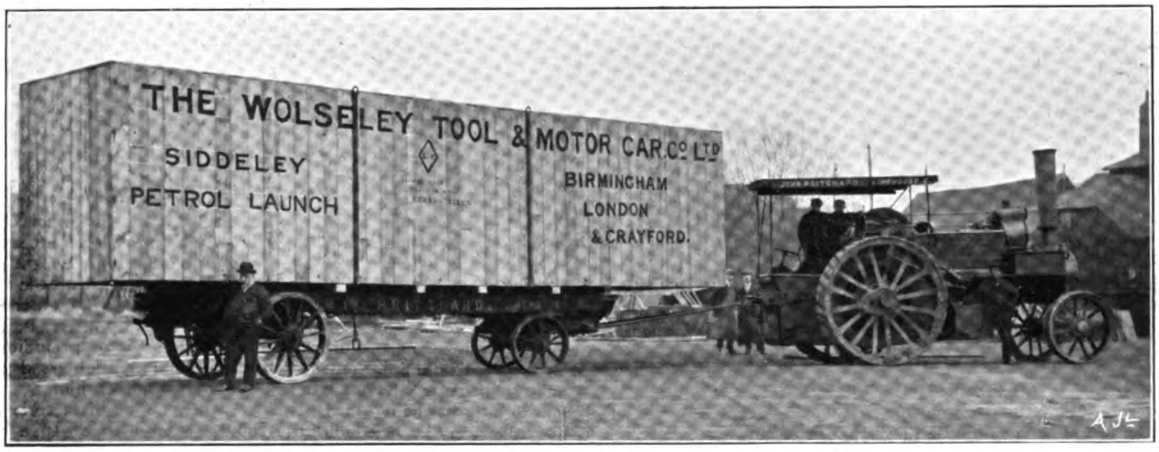


Most of our readers who visited the Olympia Exhibition will no doubt remember the very fine 30-ft. motor cruiser which was exhibited at the Wolseley Company's stand in the Boat Section. Viewed under ordinary conditions, it is difficult to realise the imposing "presence" of craft of this class. The photograph which we give above of this boat, "crated" for shipment to Buenos Ayres, is therefore interesting as giving an idea of the size and importance of a boat of this character. The height can be well gauged from the men who are standing by.

Mr. Harvey du Cros, M.P.

ALL motorists will be glad of the return to Parliament of Mr. Harvey du Cros, whose interests are so closely bound up with, and who has been so prominent a force in the development of the automobile movement. In the new Member for Hastings we may confidently expect to find that the industry and pastime have secured a vigorous supporter in the coming Parliament.

CORRESPONDENCE.

⁂ The name and address of the writer (not necessarily for publication) MUST *in all cases accompany letters intended for insertion, or containing queries.*

THE FLYING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Referring to the article in your last issue regarding aerial machines and the experiments of the Brothers Wright, it is known only to a few of the earliest pioneers of automobilism in this country that, in addition to having been the first to build an internal combustion engine motor car in this country and also the first to make a motor boat in this country, I have devoted much time and attention to the aerial machine problem.

In 1895, I made three experimental machines of small size, and based on these experiments, I took out a patent, No. 3,657, February 18th, 1896, with the intention of building a larger machine, propelled by a 4-cylinder petrol motor of 20-h.p., with the idea that this engine should be sufficiently powerful when fitted to the machine to lift the weight of one man. It was nearly two years later, however, in 1898, before I was able to commence the working drawings of the machine, owing to the demands on my time involved by the continuous changes and improvements in cars necessitated by the rapid growth of the new automobile industry. But when I had practically completed the working drawings for this machine, an entirely new principle of construction of these machines occurred to me, by which the effect of a bird's wings is obtained without any flapping action in the machine and without an aeroplane, or, to put it in another way, the reverse action of the parachute, that is to say, active instead of passive action.

There is no prior record of this principle, as far as I am aware—certainly not in Chanute, or any publication I have met with. I am convinced that it is on this principle that the aerial machine will come when it comes, as being so much more likely to be completely controllable and dirigible than the aeroplane.

I made a small model only a little over 2 feet in diameter, which was completely successful, in that it would rise to a greater height, and lift a greater weight, than the previous models having the same area. I sent the model up a number of times on Wimbledon Common, and later from the garden of my house on the river bank at Putney, with the tail and surfaces so set that I felt sure of its travelling in the desired direction. But on one occasion it encountered a wind current travelling lower than usual, and at quite 90° with the wind below. This took it down the river, into which it dropped, about 400 yards east of the iron bridge, and I was not able to recover it. I sent this up a considerable number of times on Wimbledon Common, and incidentally acquired a store of experience in connection with these small machines that rendered me quite confident of constructing successfully a machine propelled by a petrol motor to carry one man.

My first set of working drawings for a larger machine was, therefore, cancelled, and, owing to the pressure of other matters, I have been unable hitherto to proceed with a new set.

I am now about to commence the working drawings of the new motor-propelled machine fitted with a petrol motor of 28-h.p., and I shall be glad to send to THE AUTOMOTOR JOURNAL the results of further experiments when the machine is completed.

I shall also be pleased to communicate with anyone interested in the solution of this great problem.

Yours faithfully,
J. D. ROOTS.

Jan. 10th.

THE "GREAT UNPAID" AND THEIR LITTLE WAYS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—There has been considerable interest lately taken in the great discrepancy of the decisions given by the various Benches of magistrates in the country, and I think that the following great discrepancy of the judgment given by the now notorious Kingston Bench should be made public.

The last week in November, 1905, a police constable arrived at a gentleman's house in Surrey with a stereotyped notice that his car had been timed over a measured distance on the London Road, Esher, &c.

The constable was informed by the owner that he was not on his car on that day, and, unfortunately, in reply to the demand of the constable, gave the name and address of the gentleman who was driving his car.

The constable then journeyed to London and saw the driver of the car, and in his presence struck out the name and address of the owner of the car, and in pencil inserted the name and address of him, the driver. In due course a summons was issued, in which the name of the owner was struck out and that of the driver substituted in ink. The alleged offence was in the summons on "The Portsmouth Road, Esher."

I was instructed to defend, and the case duly came on on the 14th December. Superintendent Marks gave evidence that he was on duty on the Portsmouth Road, Esher, and timed car No. —, which passed him, and covered the measured distance at the rate, by his stop-watch, of 33 miles per hour.

The next witness was a sergeant who was on duty on the Portsmouth Road, also with Superintendent Marks, and he said he estimated the pace at 33 miles an hour, but had no stop-watch.

The superintendent and sergeant admitted that there was no danger to anybody, and no traffic on the road, that the car was not stopped at the end of the measured distance, and the sergeant could not in any way identify the car, and admitted that he would not swear whether it was a yellow, black, or any other colour car. This was the whole of the evidence as to pace.

I pointed out to the magistrates that under the Act the notice was incomplete, as it stated "the London Road, Esher" and that the only evidence and summons was of an offence on "the Portsmouth Road, Esher."

After consultation, the magistrates said they had decided to give leave to amend the summons, and this was done, altering the offence to "the London Road, Esher."

They offered to adjourn the hearing to permit of my bringing evidence as to speed, well knowing that it was absolutely impossible for any evidence to be obtained, and the case was consequently then decided.

The magistrates then intimated that they should fine my client £5 and 11*s.* 6*d.* costs. I objected to this, saying that no evidence whatever had been called that my client was on the "London Road, Esher," at all, but the chairman replied that everybody knew "the London Road" and "the Portsmouth Road" were one and the same. This I pointed out could not possibly be, as "the London Road, Esher," must be between Esher and London, and "the Portsmouth Road" between Esher and Portsmouth, and that it was absolutely unfair to decide that a notice and evidence given in this way was sufficient to comply with the Act. Notwithstanding this they convicted my client and inflicted the penalty.

I notice in the papers that the same Bench last week dismissed a case, because the notice only stated "Portsmouth Road, Cobham," on the grounds that it did not give the motorist sufficient indication of the exact position of the measured distance to enable him to prepare his defence.

That these two cases can be consistent, I think everyone will agree is utterly impossible. I explained to my client that in my opinion he would undoubtedly be successful on an appeal, but that, at the same time, costs of an appeal were scarcely ever allowed, and consequently although he would have conviction removed, he would have to pay about £30 to £40, and as this was his first offence (although he has been driving a car continually for four years) it was not worth while paying for such a luxury.

Yours obediently,
LEX.

Jan. 12th, 1906.

BRITISH *versus* FOREIGN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—To your correspondent Mr. Sangster I would specially commend the reading of that old fable of Æsop, in reference to the serpent stinging its benefactor. Unfortunately Mr. Sangster is a politician, and to this alone I attribute his ungenerous attack upon foreign constructors, to whom he has always owed so much in the design and construction of his cars. Apart from politics, I am sure Mr. Sangster would admit this. He accuses me of prejudice, and in reply I would point out that I am particularly unbiassed in the matter, because I have a particular advantage over him by reason of my interests being in British as well as foreign factories, and, moreover, my knowledge of the subject extends back to a period years before Mr. Sangster ever dreamed of making motor cars.

No, sir. It may be to the advantage of British manufacturers like your correspondent that they should sell their cars without competition of *any* sort, but merit will always tell, no matter where the vehicle is made, and the public will buy it regardless of every other consideration.

Assuming your correspondent is accurate, and only five hundred foreign cars are sold in America, how is it that not 2 per cent. are British? Americans at the moment import motor cars, and why is it that France, Germany and Italy get the business?

Yours faithfully,
CHAS. JARROTT.

January 15th.

6 CYLINDERS v. 4 CYLINDERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I do not think that Mr. Edge is serious in contending that a 6-cylinder engine does not take up more space than a 4-cylinder engine of the same horse-power.

Mr. Edge gives some figures which I venture to suggest are entirely misleading. It is not a question of distance from dashboard to front axle. I have already pointed out that the great disadvantage on the 6-cylinder engine is that the whole weight of the engine is placed far forward over the front wheels, causing wear on the front tyres, making the steering harder, and rendering the car less controllable. This can easily be appreciated upon inspection of a 6-cylinder car. In order to prevent the wheel base from being abnormal the bonnet is carried right forward until it projects at least a foot in front of the front axle, and this with the results I have mentioned is not only bad design, but is a very serious disability in my opinion.

As Mr. Edge has been good enough to give some figures, I shall be glad if he will oblige us with some more figures.

I have carefully taken the dimensions of a 40-h.p. Mercedes, belonging to a friend of mine, the design of which is absolutely up to date, and in which I notice the designers and constructors make a point of seeing the bonnet and engine do not project over the front axle in the slightest degree. This is, of course, as it should be, in order that the weight should be properly distributed.

The following are the dimensions which I took from the 40-h.p. Mercedes:—Length from dashboard to front axle, 2 ft. 9½ in.; from dashboard to front of front cylinder, 2 ft. 1½ in.; length from dashboard to radiator, 2 ft. 6½ in.

Will Mr. Edge kindly oblige with the corresponding dimensions of the 6-cylinder Napier?

Yours faithfully,
H. GLADSTONE COLEBROOK.

Guildown, Coolhurst Road, Crouch End.
January 15th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Mr. Hutton is so pleased with his little joke about "the twenty-ninth valve" that he has sent it to every motor journal, and one or two daily papers as well, so that no one might miss it.

When one recalls to mind the unfortunate attempt Mr. Hutton at one time made to build his own car, one is surprised that he should talk of complication when criticising the products of a successful manufacturing firm.

The arguments Mr. Hutton puts forward against the 6-cylinder car are precisely what he used against the 4-cylinder car when he was selling 5 and 7-h.p. Panhards.

He has since found the 4-cylinder car no more liable to break down than the 2-cylinder, and although it is true there are more working parts in a 6-cylinder engine than a 4-cylinder (not 50 per cent. more as Mr. Hutton says), you have "two more strings to your bow," and should a cylinder not be working, you could continue running with proportionately less inconvenience; but if Mr. Hutton will give himself experience with a high-class and properly-designed 6-cylinder car, he will find, as scores of private users have found, that the 6-cylinder car in practice is no more liable to breakdown than a 4-cylinder, and I am pleased to say we have found the same apply to the new 8 cylinder Rolls-Royce landaulets, which have surpassed our most sanguine expectations in this respect. These cars are practically indistinguishable, as regards silence and smoothness of running, from the best electric broughams, and this result can only be obtained by our 8-cylinder system.

It would be interesting to know what make of 6-cylinder car it is that has been giving Mr. Hutton such unsatisfactory results as compared with 4-cylinder cars.

Yours faithfully,
CHAS. S. ROLLS.

Jan. 15th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In common with, I suppose, most other people interested in automobiles, I have heard a great deal of late about the merits of 6-cylinder cars. Whether this arises from a genuine interest on the part of the motoring public or from other causes, I have, of course, no means of ascertaining, though personally I have seen no signs of the former cause, despite the fact that I meet many people who might be supposed to be in touch with public opinion on such matters.

Though I am interested in 4-cylinder cars, I have an open mind, and am prepared to become enthusiastic on 6-cylinders should results justify it. Therefore, I suggest that a proper trial be made between the two, and I am prepared to lend my assistance to such trial.

If one of the 6-cylinder advocates will make a match for a race—I beg pardon, "eliminating trial"—over say 100 miles of give-and-take country, against a 4-cylinder car of exactly equal engine capacity, I will be prepared to find the 4-cylinder car, and take up the cudgels. Then, if the 6-cylinder proves to be the better type, I shall be saved from future error, and my consolation will be that I shall have rendered some service to that large body of automobilists who are at present supposed to be in doubt and tribulation on this subject.

Yours faithfully,
Jan. 12, 1906. H. H. P. DEASY

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am afraid that many of your correspondents are allowing themselves to be so far carried away by the fascination of the 6-cylinder car as to forget that there is a commercial side to the question.

My company was one of the first to manufacture successful 6-cylinder cars, which were exhibited at the Crystal Palace in February, 1904, and competed in the Glasgow to London run of that year. We found, however, that while the 6-cylinder car has many advantages, the cost of production must inevitably be very much higher than that of a 4-cylinder car of equal power, and as the soundest commercial policy is to court the class of buyer who will furnish the largest volume of trade for the longest period, we decided that to make the 4-cylinder car of ample power was better.

What may become in the future of the 6-cylinder world I do not know, but at present, judging from the prices prevailing, the 6-cylinder car cannot be considered suitable for even the moderately wealthy man.

The 4-cylinder car can be made as silent as any 6-cylinder (if I am wrong I shall be corrected, but I think I can demonstrate the truth of my statement), and power for power can be made practically as flexible.

It will, I think, be conceded that from 15 to 25-h.p. is powerful enough for this country, and that such a car is economical in up-keep. I should, therefore, be willing to match my 16-20-h.p. Sunbeam car against any 6-cylinder car of equal piston displacement per minute over a distance of say 1,000 miles, the points to be adjudicated upon being:—Silence, hill-climbing on top gear, flexibility on top gear in traffic, freedom from side slip, wear on tyres, and general reliability.

Yours faithfully,
FREDERIC EASTEMEAD.

Sunbeam Motor Car Company, Limited,
Wolverhampton, Jan. 10th.

* * *

A.A. Annual Dinner.

AT the Automobile Association's Annual Dinner, which, as already announced, will take place at the Trocadero Restaurant on Thursday, January 25th, the musical entertainment promises to be of unusual excellence. Several prominent members of *the* profession, including Mr. Arthur Roberts, are serving upon the Concert Committee, under the direction of Mr. Walter Gibbons, so well known in variety theatre circles.

The Theft of the Coupe de Pyrenees.

THE police have at last arrested someone in connection with the disappearance of the Coupe de Pyrenees Trophy from the Olympia Exhibition. They first of all took into custody a man named Hall on the charge of "frequenting the Exhibition for the purpose of committing a felony" (an indictment which suggests that the police have added to their recent accomplishments of ju jitsu and other up-to-date acquirements, the power of thought-reading), and to him they have now added another alleged delinquent, to wit, one of the name of Burn, who it is alleged, together with the man Hall of the felonious intentions, arranged with a Camden Town carman to convey a parcel from Olympia on the morning of November 25th. This parcel is presumed to have been the trophy, and the two persons have been remanded, in order, as the magistrate says, that they may be "brought up together."

THE MOTOR IN AGRICULTURE.—From time to time we have shown the Ivel agricultural motor working in various forms. A new instance is shown in the above picture, which was taken in a field near Biggleswade, Beds. In this the Ivel is hauling no less than three mowing machines, the cut of each machine being 6 feet, the three mowers therefore cutting 18 feet of grass at a time. The same work would take at least six horses to accomplish. In addition to the work being so much more rapidly carried out, it is claimed that the cost is half that of animal traction. The field operated upon was 8 acres in extent, and the whole was cut down in 2 hours, the consumption of paraffin during the work being 4 gallons.

Brussels Salon.

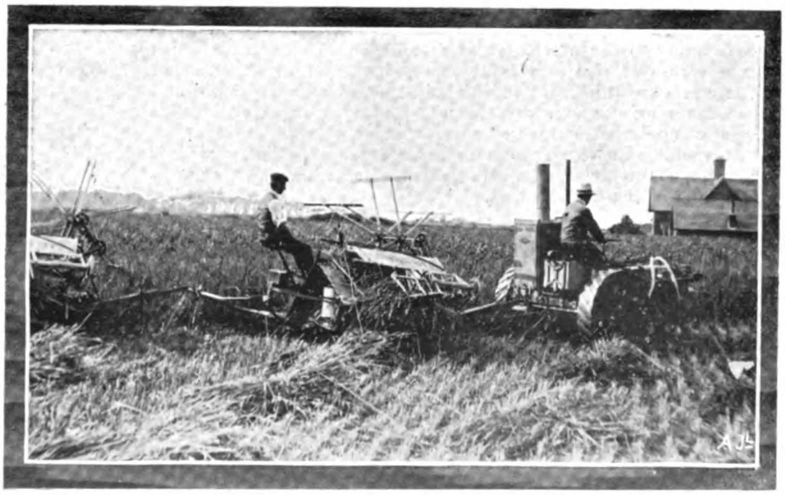
SATURDAY last was the opening day of this Exhibition at the Palais du Cinquantenaire, the 25th instant being appointed for the closing. Already the show has received strong patronage from the paying public, who are keenly interested in many of the fine chassis and car models which have already done duty at Olympia or Paris. With hardly an exception, all the leading Continental manufacturers are represented by their agents. British exhibits are not a feature of this Belgian annual fixture.

A Premium for Care.

THE excellent idea of giving bonuses to motor 'bus drivers for an absence of accident, has been adopted in the Ealing neighbourhood, and is said to have the effect of making the drivers extremely cautious and careful.

Follow the Light.

APROPOS of the proposal now being prominently brought forward to introduce a Bill to enforce compulsory lighting on all vehicles, the Guernsey authorities have just passed a measure compelling all vehicular traffic without distinction to carry a light at night. Hitherto only spring-hung vehicles were required to do so, but recently an accident occurred owing to the fact that a light van collided in the dark with an unlighted box-cart, one of the van's occupants being thrown out and fatally injured. The Guernsey authorities have not been slow to take the hint.



THE MOTOR IN AGRICULTURE.—Another picture of the Ivel motor hauling two reapers and binders and cutting a width of 10 feet at the same time. The work in this instance was carried out on Mr. Capon's farm of Hillside, near Biggleswade. The equivalent in animal power would have amounted to three horses to each binder.

4 and 6 Cylinders.

A LECTURE, illustrated by diagrams, upon this subject, was announced to be given by Mr. Donald G. Snodgrass, B.Eng., to the Automobile Class at the Northampton Institute, Clerkenwell, on Thursday of this week.

Tramways or Motor Omnibuses.

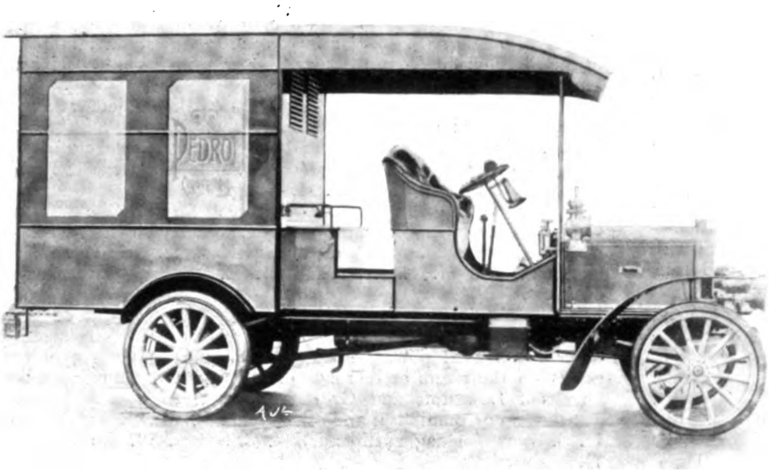
OXFORD ratepayers are up in arms at the proposal of the Town Council to electric-tramify the town at a cost of £180,000. At a recent meeting of the ratepayers, by an overwhelming majority, resolutions were passed in favour of a service of motor omnibuses instead. The question appears likely to result in a poll to arrive at a satisfactory solution.

"Omnia."

A NEW well-illustrated automobile weekly publication, under the above title, edited by M. Baudry de Saunier, at 20, Rue Duret, Paris, has made its appearance with the new year. The newcomer is to deal with all branches of the sport and industry, and the name of its editor is, needless to say, a guarantee of its general excellence.

Second Annual Birmingham Motor Car Show.

THIS Show, at Bingley Hall, opened at 3 p.m. on January 19th by the Right Hon. the Lord Mayor of Birmingham, will remain open until January 27th. The exhibits, which are more numerous than at the first Show, include models of leading British and Foreign manufacturers. The band of H.M.'s 1st Life Guards has been engaged to perform daily. Five per cent. of the gate receipts will be given to local charities, in like manner to last year.



A 24-h.p. Thornycroft Chassis fitted with a special body suited to the commercial requirements of the British American Tobacco Company. The van is intended for work in India, and behind the front bucket seats a second row is provided to seat coolies. Special attention has been given in its construction to the question of ventilation. The vehicle is now on its way to Bombay.

COMMERCIAL POINTS.

To Ring Up Argylls, London.

MESSRS. ARGYLLS, LONDON, LIMITED, advise us that in consequence of the delay occasioned their clients through the want of proper telephone connections, they have now two lines to their Newman Street premises. The new numbers are 2,641 and 2,642. Last week the builders commenced the demolishing of the old property leading to Rathbone Place, and in the course of two months or so, the commodious premises in Newman Street will be doubled, and accommodation for over 400 cars arranged for.

The Humber Works' Dispute Settled.

A SETTLEMENT of the dispute at the works of Humber, Limited, Beeston, has been satisfactorily settled, and work is now in full progress. About 90 society men recently handed in their notices, and left work on account of alleged preferential treatment, but the matters in dispute have now been cleared up. We understand that owing to the removal of certain society restrictions that were in force in the past, the output at the works is now considerably increased, while the men are actually earning more money.

New Cars for Old.

THE offer made a little time ago by the Gladiator Company to exchange an old car for a new 1906 Gladiator model, under certain conditions, expires, we are reminded, on the 31st of the present month.

MESSRS. R. AND J. PULLMANN received last week an order from the British Automobile Commercial Syndicate, Ltd., to re-tread two of the Pullmann non-skid covers. Accompanying the instructions, a gratifying testimonial was included in a letter, as follows:—"We are sending you two of your non-skid covers to-day, which have been running successfully now some 6,000 miles. These non-skids were supplied to the car (which is a 22-h.p. Spyker) in June last, and have been used by the owner for 3,000 miles. We have used the car for demonstrative purposes, and running about London for 2,000 miles. This mileage has been accounted for by a Smith's Speedometer."

MR. SIDNEY GIRLING, who was at the wheel of the Siddeley racer in the last Eliminating Trials for the Gordon Bennett Cup, ru in the Isle of Man, has, we learn, joined the staff of A. Darracq and Co., Ltd. Mr. Girling will be in attendance on the stands of the Darracq Company's agents at all important shows throughout the country, and will have for demonstrating purposes one of the Company's latest productions—the 20-32-h.p. Darracq.

MR. ERNEST H. ARNOTT, who had the management of the Minerva Car Department at Messrs. C. S. Rolls and Co., until they discontinued the agency, advises us that he has secured the sole selling rights in the United Kingdom for a new model Minerva car, which is to be produced for the 1907 season. He will begin to receive deliveries about September of this year. The new model is being built to Mr. Arnott's specified requirements. Although Mr. Arnott's agreement does not terminate with Messrs. C. S. Rolls and Co. until late in the year, they have consented to accept his resignation in order that he may keep unbroken his interest in and connection with Minerva cars. Negotiations are in progress for premises in the West End, and in the meantime communications should be addressed to Mr. Arnott, at Bolton Lodge, Teddington-on-Thames.

THE EARL OF ABERDEEN, the new Viceroy of Ireland, and His Grace the Duke of Sutherland have both just recently commissioned the Daimler Company to build them high-powered cars, each to have a 10 ft. wheel base chassis.

MR. GORDON USMAR, who has hitherto been associated with the Anglo-American Oil Company, has now joined Messrs. T. H. Harman and Company, Limited, of Regent Street, as a managing director. In his new capacity, Mr. Usmar will be connected with the sale of Vinot cars, for which his firm has the sole agency in this country. In his private capacity, however, he is already familiar with this make of vehicle, for both he and his car have for long been a popular figure at automobile meetings throughout the country.

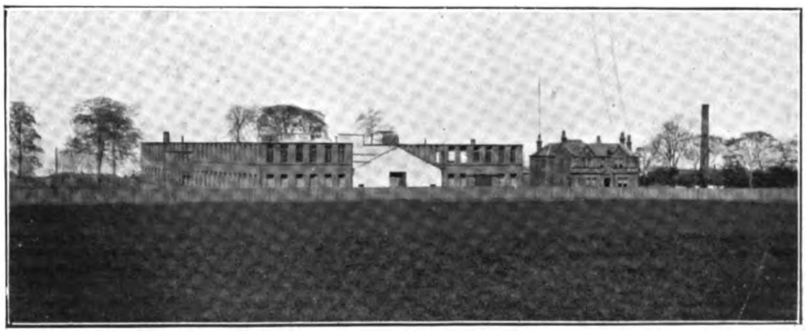
THE F. W. Peckham Motor Syndicate, Ltd., have sent us their advance Show catalogue of the Maxwell cars, which they are handling for this country. Full specifications appear in this. The syndicate at the same time inform us that they have adopted the instalment plan in introducing the Maxwell 2-cylinder 8-h.p. car, but without any addition to the listed price. Under their scheme the hire-purchase system is entirely eliminated, and the sale is made outright, the purchaser becoming the actual owner of the car upon receiving delivery.

AT the Birmingham Show the latest Clement car models will be exhibited at Stand No. 60, by Messrs. Neweys, of Birmingham.

WEST, LIMITED, manufacturers of the West Motor Cars, have appointed Mr. Robert Wight, Junior, of East Newington Place, Edinburgh, agent for Scotland for the "West" cars.

PRICE'S PATENT CANDLE COMPANY, LIMITED, advise us that they are making their motor specialities in oils, greases, clutch dressings, &c., a prominent feature at the many motor shows during the next three months, including those at Brighton, Birmingham, Crystal Palace, Edinburgh, Manchester, Glasgow, and Agricultural Hall.

MESSRS. HUMBER, LIMITED, have now on view at their show rooms, 32, Holborn Viaduct, Holborn Circus, E.C., a 4-cylinder 8-10-h.p. landaulette, which has been specially constructed for use in the London district. This car has been built with a short frame and special body for use in London, or wherever there is heavy traffic.



A view of the works of the Scottish United Engineering Company's works at Granton, Edinburgh, from which it is announced, a number of home-built cars will shortly issue.

NEW COMPANIES REGISTERED.

Bromley and District Motor 'Bus Company (Limited), 4 and 5, Sundridge Road, Bromley, Kent.—Capital, £5,000 in £1 shares. E. W. Sawyer, permanent managing director.

William E. Cary (Limited), 37, Adeline Street, Red Bank, Manchester.—Capital, £60,000 in £10 shares. Object, to acquire the business of a coach spring and axle manufacturer, &c., at Manchester and Birmingham. First directors, W. E. Cary, C. E. Cary.

Highways Transit (Limited), 59, City Road, E.C.—Capital, £100 in 1*s.* shares. Object, to adopt an agreement with Ed. Surcouf et Compagnie and Robert W. Blackwell and Co., Limited. First directors, R. W. Blackwell and E. Surcouf.

Metropolitan Fare Register Company (Limited), 3, East India Avenue, Leadenhall Street, E.C.—Capital £100,000, in £1 shares (20,000 founders'). Objects, to carry on the business of manufacturers of and dealers in taxameters, &c. First directors: L. Weiller, R. Millet, C. Mascart, F. Espir, and W. L. Matthews.

George Riddell and Co. (Limited), Falconer Street, Newcastle-on-Tyne.—Capital, £1,000 in £1 shares. Object, to acquire the business carried on at Falconer Street, Newcastle-on-Tyne, as George Riddel, motor van and trolley builders, engineers, &c.

Simplex Pneumatic Rotary Starter Company (Limited), 26, Birley Street, Blackpool.—Capital, £1,200 in £1 shares (600 deferred). Object, to acquire patents, &c., in respect of the Simplex Pneumatic Rotary Starter (provisional specification No 13,234 of 1905).

Slatter, Eastgate, and Co. (Limited).—Object, to acquire the businesses of coach builders carried on by J. T. Slatter and W. H. Eastgate respectively, and to carry on the same and the business of automobile and general vehicle builders, &c. First directors, J. T. Slatter and W. H. Eastgate.

H. E. Steel (Limited), 27, Regent Street, Cheltenham.—Capital, £10,000 in £1 shares. Object, to carry on the business of electrical, automobile, and general engineers, &c. H. Ripley, first chairman, and H. E. Steel and H. E. Ripley, first managing directors.

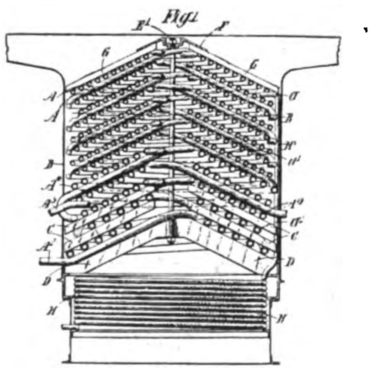
Sterry's River Trips (Limited).—Capital, £5,000 in £5 shares. Object, to build and work vessels propelled by steam or other mechanical power, for the conveyance of passengers and goods on the rivers and broads of Norfolk and Suffolk and the havens of Lowestoft and Great Yarmouth, to own and turn to account motor omnibuses and other vehicles, &c. First directors, H. S. Sterry (managing director), R. C. Sterry, W. Robbens, and H. Wainwright.

Traction Unification (Limited).—Capital, £10,000 in 1*s.* shares. Object, to undertake any business relating to the application of natural, animal, or mechanical power, or totraction, haulage, conveyance, or other similar operations.

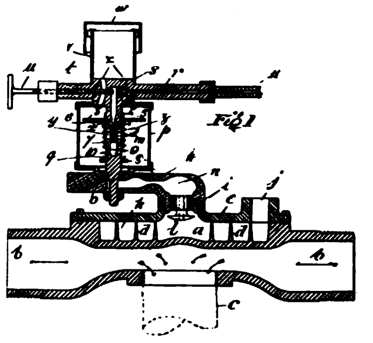
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

5347. 14th March, 1905. Improvements in or relating to Steam Generators. Thomas Clarkson, Moulsham Works, Chelmsford. This invention has for its object to construct a steam generator of the flash type, more particularly suitable for use on motor vehicles. There are two figures. Fig. 1 is a sectional elevation. The generator comprises a series of similar conical coils, A, having the apices or smaller parts of the coils directed upward. The water enters the coils at *a*, at the lowest convolution of the uppermost coil, and after circulating through this coil passes from the apex thereof downwardly by a pipe, A^1, to the lower convolution of the second coil, and after passing through this coil is led from the top thereof by a similar pipe, A^1, to the lower convolution of the third coil and so on until it reaches the lowermost convolution of the lower coil. The coils are all similarly connected, as shown, and the generator may be constructed of a single length of tubing. The diameter is increased towards the lower part of the generator, as shown at a^1, and still further down at the hottest part the thickness of the metal is also increased as shown at a^2. The coils being so arranged, and the fluid always entering at the lower part of a coil, and passing therefrom at the upper part by a tube which extends downward to the lower convolution of the next coil, the coils each serve in themselves to trap steam, and prevent it rising to the water inlet end of the generator, the result being obtained without the employment of any extra steam-trapping device. The pipes, A^1, serve also as distance pieces between the adjacent coils, and these pipes are arranged or staggered, so that one pipe, A^1, is approximately diametrically opposite to the next pipe, A^1. Between the coils and at the side opposite to that along which the pipes, A, extend, distance pieces, C, are introduced, the remaining distance pieces being omitted from the drawing for the sake of clearness. B is the surrounding casing. The water can be led to the upper end of the generator preferably by a heating coil, H, arranged in the lower part, and from this coil, H, it passes by a pipe, H^1, to the upper coil, A. The parts are kept in position by a four-armed support, D, and by plates, G, resting on the upper coil. These parts are bound together by a bolt, E^1, which extends through the support, D, and a cap, F. The steam is led to the regulator from the pipe, A^2, at the lowest end of the generator, and after passing through the regulator enters the generator proper by the pipe, A^3, whence it passes through the coil, A, and is led from the upper end of this coil to the throttle by the pipe, A^4. The coil, A, serves as a superheating coil.—December 27th, 1905.



28276. 23rd December, 1904. Improvements in Carburettors for Internal Combustion Engines. Charles H. Bryant, 12, the Embankment, Twickenham, and Arthur Watling, 9, Southampton Street, High Holborn, London, W.C. Although called a carburettor this is really a vaporiser, as it is not intended to be used with petrol or spirit. There are two figures. Fig. 1 is a sectional elevation of the apparatus. A single casing, *a*, is formed with a tube or tubes, *b*, so that the exhaust gases from the cylinder or cylinders of a motor may pass through and beneath the casing, *a*, before issuing to the atmosphere by a pipe, *c*, when the tube or tubes, *b*, is or are arranged for connection with a two-cylinder motor. Projecting from the base of the casing, *a*, is formed a convolute web, *d*, which upon the bolting of a suitable cover, *e*, to such casing, *a*, forms a spiral passage, *h*, leading from the central portion to the outer portion of the casing, *a*. The casing, *a*, has inlet and outlet openings, *i* and *j* respectively, the latter for connection with the combustion chamber of the motor and the former for the reception of the one end of a tube, *k*, having a delivery nozzle, *l*, the other end of which tube, *k*, communicates with a valve chamber, *m*. The passage, *n*, in tube, *k*, is formed with a series of restrictions of its bore, and communication with the valve chamber, *m*, is made by way of a stepped cone-shaped opening, *o*, which connects the passage with a glass casing, *p*. Fixed to the tube, *k*, is a second tube, *q*, which is formed into a plug and tapered externally at its lower end, and connected at its upper end with an oil supply tube, *r*, having a boss, *s*, and an extension, *t*, provided with a screw-valve, *u*. Upon the boss, *s*, is fixed an air supply tube, *v*, having a cap, *w*, fitted. The air admitted through tube, *v* is conducted by passages, *x*, formed in the boss, *s*, into the casing, *p*, surrounding the tube, *q*. In the passage of tube, *q*, is placed an oil supply valve, *y*, connected by pins, *z*, passing through slots, 1, in the tube to a sleeve, 2, mounted on the tube, *q*. The sleeve is provided with a circular diaphragm, 3, and a number of openings or slots, 4, adapted when the valve, *y*, is opened to allow a supply of oil to issue from openings, 5, formed in the vertical tube, *q*. The oil supply valve, *y*, is normally retained against its valve-seating, 6, by a spiral spring, 7, which bears against the diaphragm, 3, and at the other end against a collar, 8, formed on the tube, *q*. The closed end of the passage, 9, of the tube, *q*, has one or more holes, 10, to permit escape of air and any collection of oil. A pipe, 11, conveys the oil fed from the oil tank to tube, *r*, and passage, 9, of the tube, *q*. The suction created by the piston of the motor draws air through the air tube, *v*, and air passage, *x*, to the valve chamber, *m*, and causes a downward movement of the diaphragm, 3, and sleeve, 2. The valve, *y*, is opened, and a charge of oil supplied through the openings, 5, of the tube, *q*, and slots or openings, 4, of the sleeve, 2, into the valve chamber, *m*. The diaphragm, 3, being of less diameter than the casing, *p*, the air passes beneath the diaphragm. The charge of oil, together with the air, is drawn into the tube, *k*, and by the delivery nozzle, 1, is sprayed into the central portion of the casing, *a*, from whence it flows round the spiral passage, *h*, to be finally drawn into the cylinder, there to be mixed with a main supply of air to form an explosive mixture.—December 27th, 1905.



Patent Specifications Published.

Applied for in 1904.

Published January 11th, 1906.

27,603.	H. Harvey-Frost. Vulcanising apparatus.
28,276.	C. H. Bryant and A. Watling. Carburettors.
29,553.	R. and J. Hunter. Leather gloves.

Applied for in 1905.

Published January 1 th, 1906.

1,527.	L. Baynes. Petrol filter.
1,663.	G. J. Stevens and W. E. Richards. Wheels.
2,252.	L. Cox. Pneumatic tyres.
3,394.	T. Morris. Electric ignition apparatus.
4,685.	B. B. Kennedy and, others. Seats for motor cycles
5,347.	T. Clarkson. Steam generators.
6,368.	A. Nicholson. Non-skidding devices.
8.321.	C. T. B. Sangster. Crank chambers.
10,028.	T. A. Garrett. Speed recording apparatus.
12,711A.	W. Bagguley. Tyres.
13,148.	H. C. Mueller. Jump-spark apparatus.
14,318.	G. Cornilleau and A. Saint-Beuve. Electric ignition.
17,220.	L. Rushworth and others. Cylinders.
17,280.	J. Gawron. Magneto ignition apparatus.
18,399.	W. H. Frankland. Tyres.

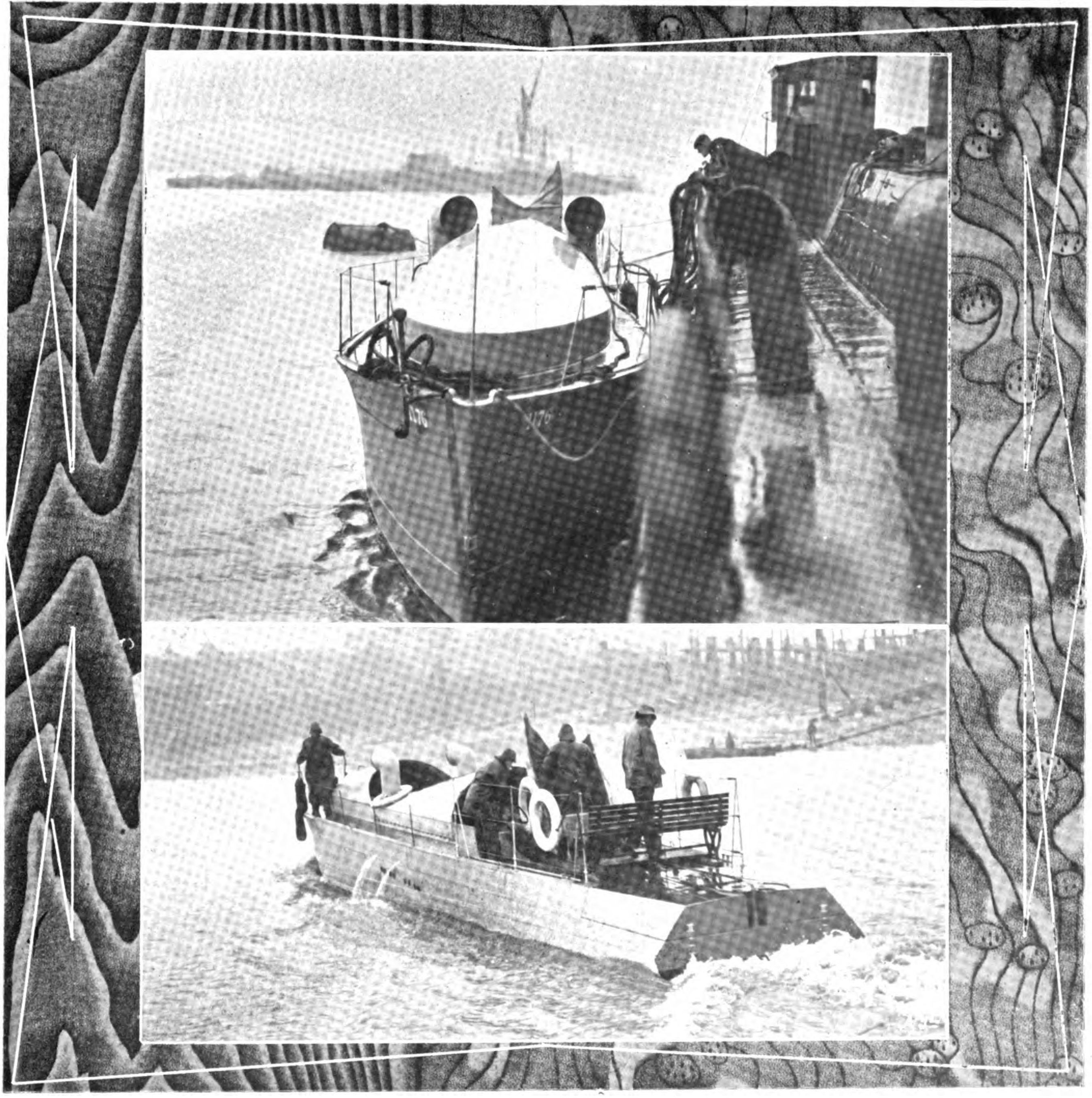
Automotor Journal, January 27th, 1906.

The AUTO MOTOR JOURNAL

(YELLOW COVER).

A Record and Review of Applied Automatic Locomotion.

No. 64 (No 4. Vol. XI.)] JANUARY 27TH, 1906. [Registered at the G.P.O. as a Newspaper.] Weekly, Price 3d. Post Free, 3½d



THE YARROW-NAPIER MOTOR TORPEDO BOAT.—Among the latest boats launched by the famous shipbuilding firm on the Isle of Dogs is a second-class motor torpedo boat, No. "1176." Her three engines have an aggregate of about 300-h.p., and in all there are twenty cylinders. Two coupled, 4-cylinder Yarrow-Napier marine engines drive each port and starboard propeller and a single, central, 4-cylinder engine is used for starting, manoeuvring, and going astern. As shown in these photographs, the boat is only in trial condition, but when fully equipped she would have a pivoted torpedo tube on the forward deck and a small quick-firing gun aft (see our article, page 103).

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

British Events.

Jan. 19–27 ...	†Birmingham Motor Show.
Jan. 26–Feb. 3	Crystal Palace Motor Show.
Jan. 26–Feb. 3	Edinburgh Show.
Jan. 27 ...	Tri-Car Hill-Climb, Lewisham A.C.
Feb. 15 ...	*4,000 Miles Tyre Trials.
Feb. 15 ...	*Lamp Trials.
Feb. 9–17 ...	Liverpool Motor Show.
Feb. 9–17 ...	†Newcastle Motor Show.
Feb. 10 ...	Tri-car Hill-Climb, River Hill (Lewisham A.C.).
Feb. 19 ...	Scottish A.C. (Western) Annual Dinner.
Feb. 23–Mar. 3	†Manchester Motor Show.
March 8 ...	A.C.G.B.I. General Meeting.
March 9–17...	†Glasgow Motor Car Show.
	†Sheffield Motor Show.
March 24–31	Cordingley and Co.'s Motor Show.
June ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
Aug. ...	*Van Trials.

Foreign Events (Trials, Races, &c.).

Jan. 26–30 ...	Calcutta Motor Trials.
Feb. 3–18 ...	Berlin Motor Show.
Feb. 3–18 ...	Turin Automobile Show.
Feb. 5–11 ...	Paris Voiturettes and Tri-car Trial (*Les Sports*).
March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
April 1–17 ...	Budapest Exhibition (A.C. of Hungary).
April–May ...	Milan Exhibition.
April ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 13–14 ...	Tour de France (Motor Cycles and Voiturettes).
June 10–16 ...	Herkomer Cup.
June 28–29 ...	Kiel Motor Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15–16...	Mont Ventoux Hill-Climb.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

A Tourist Trophy Resumé.

On another page we this week reproduce a paper, read by the technical editor of this journal before the Automobile Club, on the various aspects of the Tourist Trophy Race, which is to be held again this summer. Under ordinary circumstances we might perhaps be expected to reproduce the paper without comment. But the circumstances are *not* quite ordinary. Since the first proposals to hold a competition of this description were put forward, or at any rate since the moment when they began to assume practical shape, The Automotor Journal has been working in full sympathy with the Technical and Races Committees of the Automobile Club, for the purpose of rendering the rules governing the competition as suitable and comprehensive as possible, and the event itself as successful as could be. Our readers will remember the large amount of space we have devoted to the question, and the large number of tables and calculations we have prepared and published for the purpose of throwing light on various aspects of the competition. In spite of all that we have written, however, and in spite of the amount of attention that has been devoted to it by the two club committees referred to above, we are still aware that the principles involved in the Race that was actually run in the Isle of Man and will probably be held again and again—during subsequent years—in a more and more improved form, are still very largely a matter of mystery to the great bulk of automobilists. To put the matter shortly, there are still a good many people of intelligence who are interested in automobilism who cannot eliminate from their minds the idea that the main object of the Tourist Trophy is to test the fuel consumption of the ordinary makes of car. The opportunity provided by the club to the technical editor, of putting before the bulk of the club's members, and in consequence automobilists generally, the objects for which the Technical and Races Committees have been striving, was, in consequence, one not to be neglected, both with the view of rendering the problem more widely understood—of, in a certain sense, popularising the Tourist Trophy question—and at the same time of enabling automobilists generally to form an opinion upon the conclusions to which the Races and Technical Committees had come, and to realise the immense amount of work that had been involved. It is because the paper which we reproduce is specially designed for this purpose, and because comprehension of the situation by automobilists generally is so important with a view to future developments, that we not only reproduce the paper in full, but comment on it in this part of the journal.

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Satisfactory Recognition.

It is pleasing to find that in the discussion which followed the reading of the paper, recognition was accorded to the amount of work done by the staff of The Automotor Journal in connection with the Tourist Trophy Race, and to note that members of the club who have taken a leading part in the elaboration of the rules and the organisation and management of the race have accorded a full meed of recognition to the extent to which The Automotor Journal has been a contributor to the development and success of this important competition. This recognition is the more satisfactory to us, inasmuch as we believe we are correct in stating that The Automotor Journal is the only automobile publication which has done anything at all to place the various aspects of the Tourist Trophy problem intelligently before the public, and that in as far as automobilists generally—excepting, of course, those who have been in special touch with the preliminary discussions and arrangements at the club—adequately comprehend the situation, their comprehension is in a large measure due to the amount of time, trouble, and space which we have devoted to the subject.

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A Principle to be Encouraged.

Apropos of the discussion on the Tourist Trophy referred to above, the very well-considered remarks of Mr. Coleman, who took a leading part in it, raised a side issue of much general interest, and suggested a principle which it would be satisfactory from every point of view to see regarded either as one of the unwritten laws of the Automobile Club, or, better still, embodied in something of the nature of a "standing order." We refer to Mr. Coleman's suggestion that the committee of the club, in deciding all events of a competitive character, should be governed entirely by a "sporting spirit"—that is to say, that any member of the committee who may have a definite financial interest in any particular type of car which might be concerned by, and affected either beneficially or adversely by, a measure proposed, should refrain from exercising his vote on the committee. He should, of course, be permitted to discuss it fully, to express his opinion from every point of view, and do all he can to show the club in what way the interests of those concerned are likely to be affected. But there his concern with the matter should end, and when the question is put to the vote it should be decided by the votes of those who will look at it without any suggestion of interest affecting the manner in which they determine it. The proposal, as we observe, is one which, in the interests of any movement, has much to recommend it. We do not for a moment desire to cast the slightest reflection on past decisions of the Club Committees in such matters. But the great body of manufacturers and those pecuniarily interested in the trade would certainly feel satisfaction if they knew that the ultimate decision of all such questions were left in the hands of men who look at them from a disinterested point of view, and there is no doubt whatever but that motorists in general cordially welcome an authoritative recognition of this principle.

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A Further Triumph for the Petrol Engine.

More than once have we had occasion to remark that the success of the petrol engine as applied to boat propulsion has as yet been far less conspicuous and not nearly so fully developed, generally speaking, as its employment as the prime mover of cars and other vehicles. Possibly this is due, amongst a variety of other causes, to the motor-propelled boat making a less direct, or at any rate a less general appeal, to the utilitarianism of the community at large. Ever since the fine performances of the Napier boats, however, and the good service they have rendered in connection with military and naval manœuvres, we have insisted upon the importance which the petrol-driven boat must ultimately assume for the purpose of naval defence. It is therefore with great satisfaction that we draw the attention of our readers to the illustrated account, which we give on another page, of the petrol-driven torpedo boat, provided with Napier-Yarrow engines, which has been built by Messrs. Yarrow, and subjected to a course of successful trials recently on the Thames. The boat has been built throughout, engines and all, by Messrs. Yarrow, the engines, however, being made according to designs and drawings furnished by Mr. Napier. The occasion provides the first appearance of the petrol-engined boat of this type, and that is the first point of interest in regard to the trials to which we refer. The second is the very fine performance of the finished boat. It is only, as our readers will see from the account which we publish, sixty feet in length, and belongs therefore to the class known in the Navy as second-class torpedo boats. It has developed, however, the fine speed of 26¼ knots per hour—a speed which has hitherto only been accomplished by first-class torpedo boats, which are of considerably larger dimensions, and have considerably greater engine power. Among other advantageous features of the new boat must be mentioned the small amount of "bow" wave which it throws up in front of it, owing to its great buoyancy, as compared with a steam-propelled torpedo boat—a characteristic which, of course, has also assisted it in attaining its high speed. The absence of bow wave, and the small size and compactness of the little vessel, render it considerably less conspicuous than any of the ordinary types of torpedo boat at present in use. This, needless to say, is one of the greatest advantages which a torpedo boat can possess, as it is on its comparative invisibility that it depends for its immunity from annihilation. That the new boat should combine so many advantageous characteristics may indeed be regarded as a triumph for the application of the petrol engine to this particular purpose, and may lead us to hope that in the near future it may, at any rate for torpedo boat and possibly for scouting work, prove to be of the greatest service to the country.

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The French Grand Prix. One really does not know what to say about the French Grand Prix, except that it is now quite certain that it is going to take place, though how far the rules will modify the character of the event from what its original promoters contemplated is a question on which we must reserve judgment till the regulations which govern it have been settled. There is no doubt that it will prove a great, attractive, and exciting spectacle and, recognising this, we have throughout recorded minutely all news in regard to it as soon as they have been available. We have, as is our custom, kept in close touch with the arrangements of the French Club in the matter, and have generally provided all the information necessary to keep our readers fully conversant with the progress being made in its gradual materialisation. As a matter of fact, we were the first English journal to point out what the precise course would be, to indicate that it would very likely extend over two consecutive days, and to announce the important regulations that have been made in regard to tyre manipulation during the race. Last week we published a sketch map of the selected course—perhaps it would be more correct to say the battle-ground—and this week we are publishing a more detailed map, together with a number of photographs of the more interesting points of the course. No doubt, as we have already said, it will be a tremendous affair. There will be great enthusiasm, particularly among French automobilists, who will come from all corners of the Republic in vast numbers to witness it. The course is straight, and, in general, level, with no difficult corners, and the speeds registered, we may be quite confident, will be terrific, for it will not be like the Gordon-Bennett Race in the Auvergne, where the modern racing monster was prevented by an intricate and difficult course from developing its full whirlwind speed. What it will show, and what it will teach, either to the public or to engineers, is, however, another matter altogether. Frankly we do not anticipate that anything new or useful will be learned. Mere speed racing, without restrictions for eliminating pure "speed-machines," seems to us, and we believe to the vast majority of automobilists, to have had its day of usefulness. It has undoubtedly done good service in the past, but we should not have been over-grieved had the last Gordon-Bennett been the last race of the kind, and we believe manufacturers generally would have been glad also.

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A Case Beyond Comment. Last July, Mr. F. W. Perkins was driving a motor car belonging to Mr. W. Dunn, of Lillystone Hall, Stock, Essex, up a hill near Margaretting. On this hill an accident occurred, in which a little girl collided with the car and broke her arm. The driver of the motor car was arraigned before the Chelmsford magistrates on the usual charge, and at the adjourned hearing Mr. Staplee Firth, who represented the defendant, informs us that he actually observed on the Clerk's table the conviction form already filled in, the Clerk having obviously concluded that, as it was a motor car case, conviction was a foregone conclusion. A very *ex parte* account of the occurrence had already appeared in the *Essex Weekly News*, in which Mr. G. W. Taylor, one of the magistrates who sat on the Bench and tried the case, is financially interested.

Under the circumstances the case was brought into the Divisional Court on Tuesday, and a *rule nisi* applied for; i.e., a *rule* to call upon the magistrates to show cause why the conviction should not be quashed on the ground of gross prejudice, &c., &c. The Divisional Court on the facts being cited at once granted the order. The case must accordingly be regarded as at present *sub judice*. What further remarks might be made on the subject must therefore be reserved till the matter has been finally settled. In the meantime we may point out that a previous conviction against Mr. Hassall by the same Bench was recently quashed by the Divisional Court, and may also mention that the hearing of an actual case usually follows a few weeks after a "rule" has been made.

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The Forgiveness of Queen Margherita.

THE foolish youths who attempted to endanger the life of the Dowager Queen of Italy, by erecting a barricade of stones on the road her automobile was expected to travel, were, as we have chronicled, committed to prison for their dastardly and senseless outrage. The Queen, however, with her proverbial kindliness, has obtained their release, and a short time back visited them in prison, and personally presented them with their pardons. We hope this will not have the effect of encouraging other hooligans to do likewise.

THE GRAND PRIX DE L'AUTOMOBILE CLUB DE FRANCE.

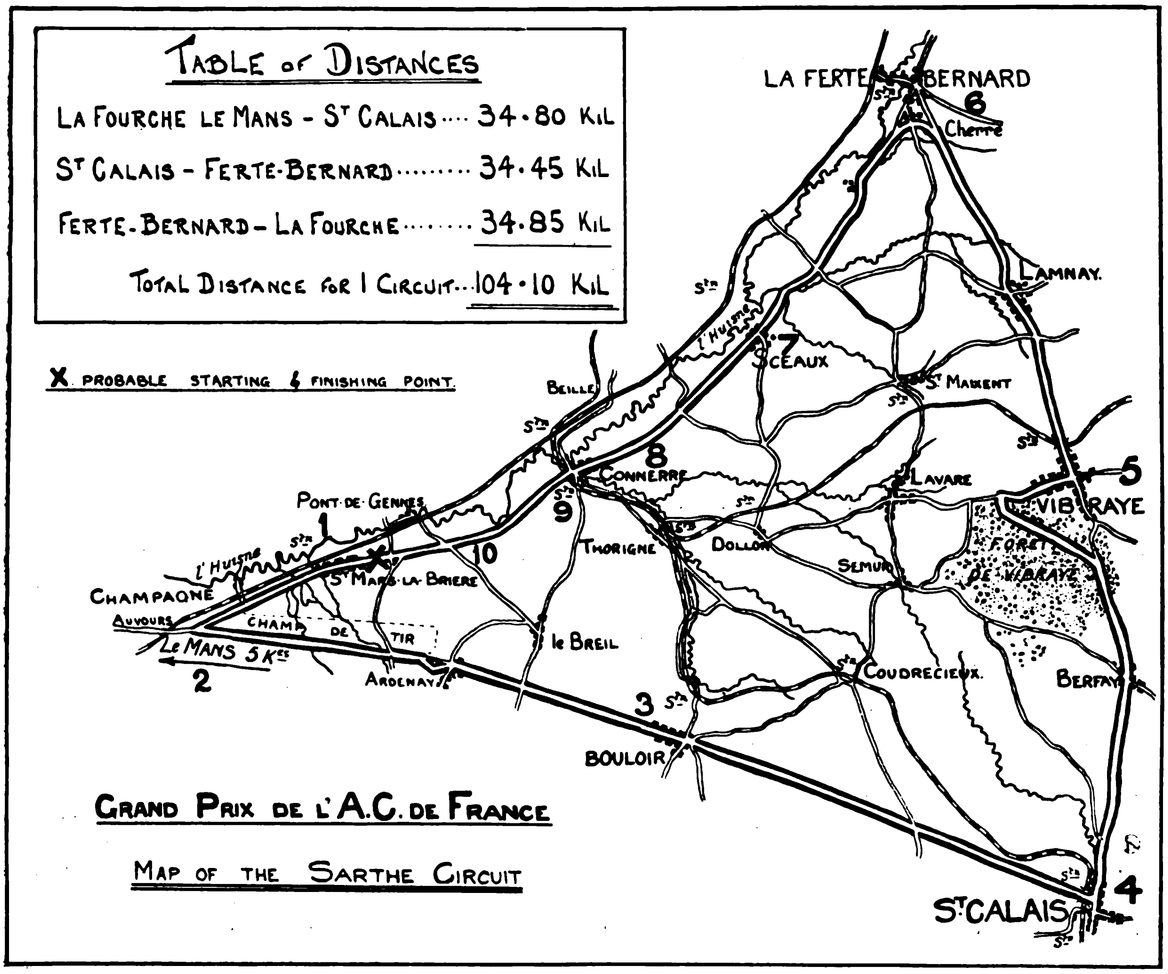


TABLE OF DISTANCES

La Fourche le Mans - St Calais	34·80 Kil
St Calais - Ferte-Bernard	34·45 Kil
Ferte-Bernard - La Fourche	34·85 Kil
Total Distance for 1 Circuit	104·10 Kil

X probable starting & finishing point.

GRAND PRIX DE L'A.C. DE FRANCE

MAP OF THE SARTHE CIRCUIT

THE SARTHE CIRCUIT—the Course for the A.C. de France Grand Prix Race. The straight stretch of road between Connerre and La Fourche le Mans, one of the proposed spots where the start and finish is to take place. (1 on sketch map).

THE SARTHE CIRCUIT—the Course for the A.C. de France Grand Prix Race. A forked road at Yvry. (2 on map).

We were enabled last week not only to announce the selection by the Sporting Commission of the A.C. de France of the Sarthe Circuit for the big speed event of the A.C. de France this year, but we were also able to publish a confirmation of our previous statements that the race would possibly extend over two days, and that the manipulation, repairing, and changing of tyres would have to be entirely undertaken by the driver and mechanician of each respective car. These important departures on the part of the French Club are, unquestionably, steps in the right direction, and will tend to render the race somewhat more of a sporting event than this type of contest, with its armies of assistants, has hitherto been on the Continent. The feeling of the Sporting Commission was so pronounced in regard to the race being held over two days, only three votes being given against it, as stated by us last week, that the Committee of the A.C. de France had no hesitancy in accepting the recommendation of the Commission after the "opposition" had been afforded an opportunity of placing their views before the Committee. The broad principles of this important speed meeting have therefore now been definitely agreed to, and it only remains for the detailed regulations to be promulgated, based upon the principles laid down.

The chief points which remain in abeyance are those of the actual date for the race, in June or July, and the entrance fee per vehicle. Although officially the actual name of the event has not been announced by the French Club, there is little reason to doubt that it will

THE SARTHE CIRCUIT—the Course for the A.C. de France Grand Prix Race. The only railway level-crossing on the Course, situated at St. Calais. (4 on map).

At the entrance to Bouloire Village. (3 on map).

Vibraye Village, through which the Course passes. (5 on map).

THE SARTHE CIRCUIT—the Course for the A.C. de France Grand Prix Race. The sharp angled turning just before La Ferté Bernard, one of the corners of the triangular course. (6 on map).

THE SARTHE CIRCUIT—the Course for the A.C. de France Grand Prix Race. Sceaux-Sur-Huisne Village, between Ferté Bernard and Connerre. (7 on map).

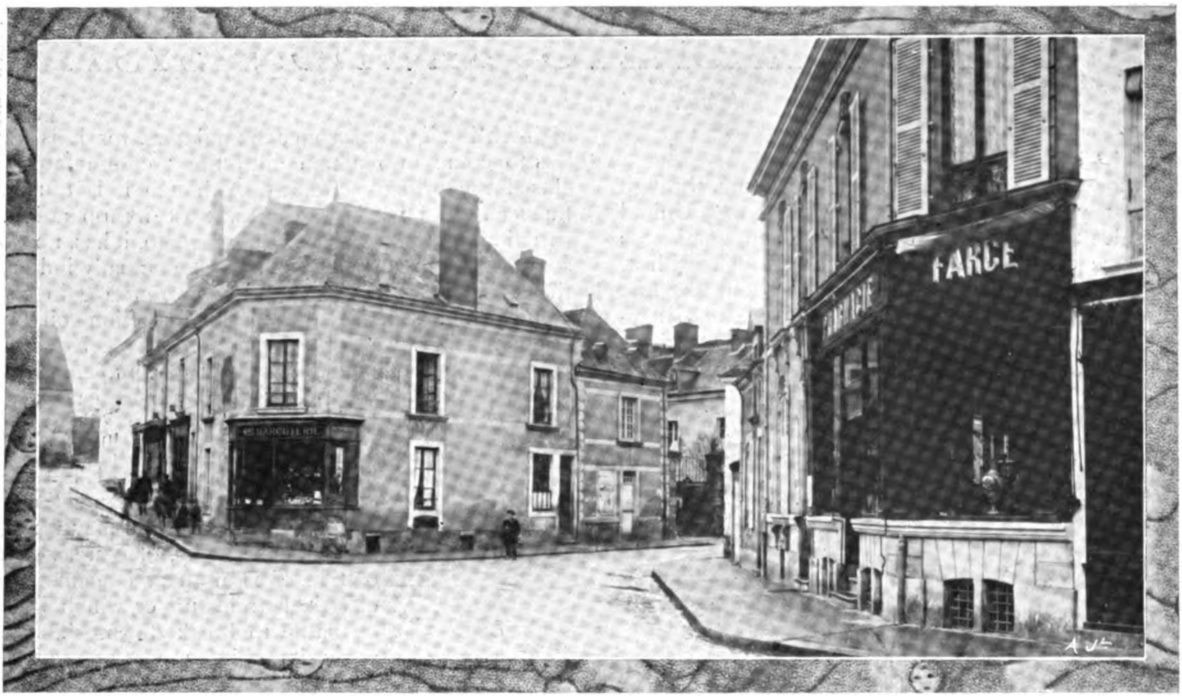
be, as hitherto, known by the title of the Grand Prix de l'Automobile Club de France.

Regarding the Sarthe Circuit, and its suitability for the race, as we stated last week, the extraordinary straightness of the majority of the roads forming the course selected will permit of the very highest speeds being maintained over very considerable distances, and reduce the event to a speed race pure and simple. In only a few cases would the road have to be "amended" to enable the cars to have still further opportunities to maintain their speed, these points being at Vibraye, St. Calais, Ardenay and La Fourche le Mans. In the latter case it is hoped that arrangements could be made for a good round sweep to be constructed through the Auvours Camp, which is situated in the angle formed by the forked roads leading from Mans to Ferté Bernard and St. Calais respectively.

At Vibraye, in addition, a detour is suggested through the Vibraye Forest. The distance over the whole course may roughly be taken at 104 kiloms.

The most suitable point for the start is considered to be on the straight stretch near St. Mars (4 kiloms. from Connerre and under 1 kilom. from Pont-de-Gennes railway station) shown in one of our photographs (No. 1), and indicated by a number, as also are the other views which we give of the course, on the detailed sketch map which we publish this week. The "straight" in the course comprises not less than 80 kiloms. of the whole, and might almost be said to approach nearer 90 kiloms. The roads are, generally speaking, in splendid condition, and there will be no difficulty, at a comparatively slight cost, in remedying any defects of the surface which at present may exist. As stated last week, there is only one level crossing, viz., at St. Calais (see photo No. 4), and it is hoped for the race days to arrange that a minimum of railway traffic shall pass over this point. At Vibraye the railway goes under the road, and at Connerre the railway crosses by a bridge. In regard to the course being served by railways, no better selection could be made, as the Paris-Brest line runs parallel with the whole length of the

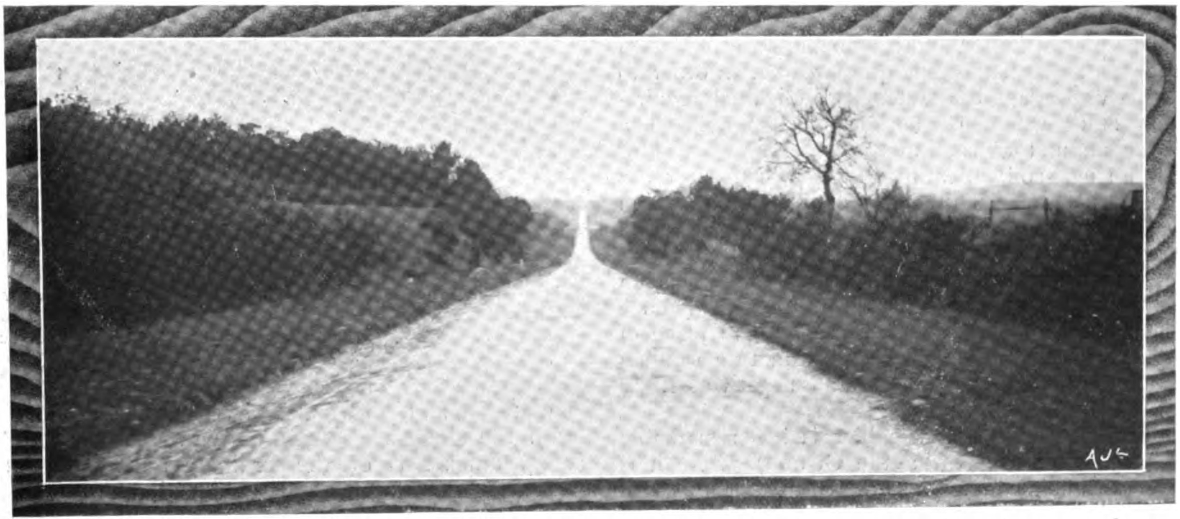
THE SARTHE CIRCUIT—the Course for the A.C. de France Grand Prix Race. The approach to Connerre Village. The course turns off sharply at the church seen in the distance. (8 on map).



THE SARTHE CIRCUIT—the Course for the A.C. de France Grand Prix Race. Sharp turn in the village of Connerre. (9 on map).

starting side of the course, from Le Mans to Ferté Bernard, with six stations within this distance. On the south side of the course, two stations, viz., at Bouloire and St. Calais serve, and on the east side Vibraye Station is situated exactly in the middle of that side of the course. In addition, visitors will, without difficulty, be enabled to get easily by rail from each side of the inside of the triangle to the other sides, as the lines crossing from different directions join the Paris-Brest line at Connerre. Intercirculation between points will also be specially easy, owing to the number of excellent urban roads which exist in every direction, and arrangements are to be made for bridging over at several points of the course to enable traffic to continue uninterruptedly during the racing. The station at Pont-de-Gennes, the suggested starting point, is within three hours of Paris and twenty minutes of Mans, whilst the ordinary fare from Paris is eight francs only, both very important factors likely to help enormously towards a huge crowd assembling. The actual distance to Le Mans from Paris is 209 kiloms.

Excellent telephonic and telegraphic installations are already at a number of the points on the course, and the local authorities, needless to say, are all enthusiastic in their desire to support the event locally, and to organise fêtes, &c., for the occasion. Le Mans is, moreover, a town of considerable importance, having about 70,000 inhabitants, and has historical automobile claims from the fact that it is the home and place of business of some of the earliest workers in the automobile industry, such as MM. Leon and Amédee Bollée, and such well-known champions in the automobile world as Henri and Achille Fournier, Hemery, Paul Jamin, &c. Finally, in addition to excellent hotel and other accommodation at Le Mans, both at St. Calais and Ferté Bernard considerable facilities will be found in the same direction.



THE SARTHE CIRCUIT—the Course for the A.C. de France Grand Prix Race. One of the long straight runs on the circuit. This road is between St. Mars and Connerre. (10 on map).

HIGH-TENSION MAGNETO IGNITION SYSTEMS.

(*Continued from page* 11.)

THE "CASTLE" SYSTEM.

So well-known has the name "Castle" become, through the popularity of the goods supplied by the United Motor Industries, that it is in itself sufficient guarantee of excellence among motorists who are familiar with it. When the Castle high-tension magneto system was first introduced, the magneto proper was of the real high-tension type, and contained within itself everything except the distributor. Since then, however, the system has been altered, and a low-tension magneto is now employed in conjunction with an external induction coil. Unlike most such systems, the induction coil is in this case of the "trembler" type, which consequently dispenses with any form of positive "contact-*breaker*," such as is usually fitted to the magneto itself. At the same time, an ordinary "commutator," or contact-maker, is nevertheless employed, but this also is an independent unit. So far as the magneto is concerned, therefore, absolute simplicity is the ruling factor. As a unit, it is a low-tension magneto pure and simple, and it carries no supplementary mechanism of any description. Some motorists still prefer to use a multiple-coil, rather than a single-coil with a high-tension distributor, and it is mainly for this reason that each part has been kept quite distinct in order to make it easy to adapt the system to individual requirements. Thus, when a multiple-coil is employed, a simple "commutator" is all that is required, whereas for use with a single-coil, a neat high-tension distributor has been constructed, which also embodies a low-tension contact-maker in the same casing.

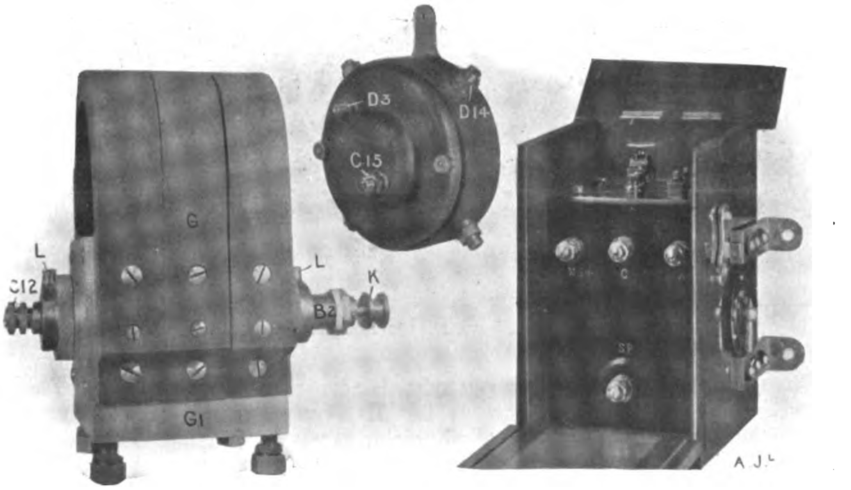


FIG. 1.—The Castle High-Tension Magneto System. View of the complete outfit consisting of magneto, single coil, and combined high-tension distributor, and low-tension commutator.

The net upshot, therefore, is that the Castle magneto *system* is virtually identical with ordinary high-tension systems using accumulators, for the only real difference is the substitution of a low-tension magneto in place of the battery, using the two ends of the armature winding as though they were the positive and negative battery terminals.

Electrically, the use of a trembler is less remarkable in this system than in one (like the Gianoli), where it is employed without a contact-maker. In the Castle system its position is exactly similar to what it is in any ordinary high-tension ignition from accumulators, for it is powerless to come into action until the "commutator" has closed the primary circuit. Although it is thus uninfluenced, as regards the instant of its operation, by variations in the voltage of the magneto, it has, no doubt, some regulating effect on the voltage actually induced in the coil. Rapidly as does the current regain its full value when switched on to the induction-coil by the contact-maker, yet for the moment it receives a check which it requires a certain period to overcome. With a well-balanced trembler, carefully adjusted to operate at a given current strength, there is therefore every possibility that this value will not be exceeded, no matter how much the actual voltage of the magneto may vary—the consequence being, of course, that the coil itself is protected against undue electrical strains under which it might be liable to break down. This issue gains its chief importance, however, from the fact that the same induction-coil (and same primary winding) is used for the alternative battery ignition which is specially provided for in this system. It has not generally been considered feasible to use one coil—or at any rate the same primary winding—for both magneto and battery ignition, and it is doing this that constitutes the real originality of the Castle system.

Orthodox general design has been followed in the mechanical construction of the magneto, and a very neat form of combined "commutator" and distributor has been made for use with the single-coil system. With multiple-coils the contact-maker is of the ordinary roller-contact type, already well known in connection with battery ignition.

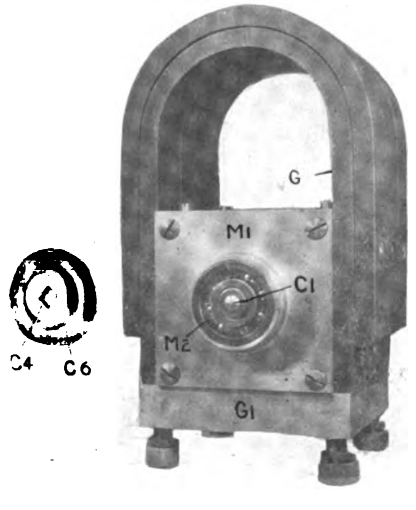


FIG. 2.—The Castle High-Tension Magneto System. View o the magneto showing the live end, C^1, of the Armature Coil, and the Collector Contact, C^4, which is carried in the detachable Screw Cap, C^6.

Our Illustrations.

Views of the magneto are given in Figs. 1, 2, and 3, and from these its simplicity will be obvious. A view of the single coil, with its distributor, is included in Fig. 1 in order to make that illustration represent a complete outfit, but the multiple coil and contact-maker, which are sometimes used instead, are shown separately in Figs. 5 and 6. In Fig. 4 the combined commutator and distributor is taken apart, while Figs. 7 and 8 show the usual diagrams of connections which accompany all these articles, and enable one system to be compared graphically with any other, besides facilitating, in the case of Fig. 8, the practical installation of the system on any ordinary vehicle.

The Magnets.

There is nothing about the horse-shoe magnets, G, to render them different from those usually employed. They are composed of six separate elements, arranged side by side in pairs, and are mounted on an aluminium base-plate, G^1, by means of screws, which are inserted from beneath and pass up into the solid cast-iron pole-pieces, G^2. Separate screws passing through the magnet limbs retain the pole-pieces in place, and the whole magneto is secured to the engine by four studs which project from the base-plate, G^1.

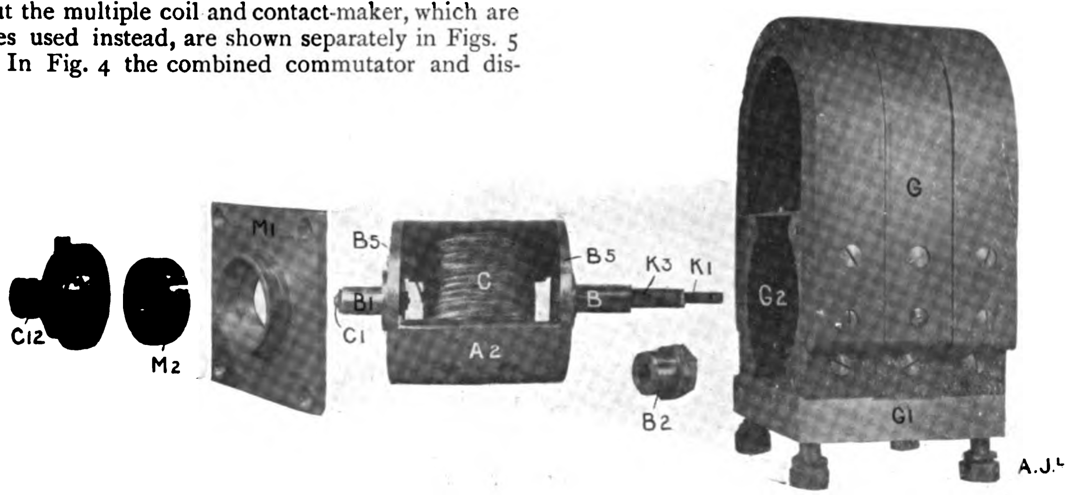


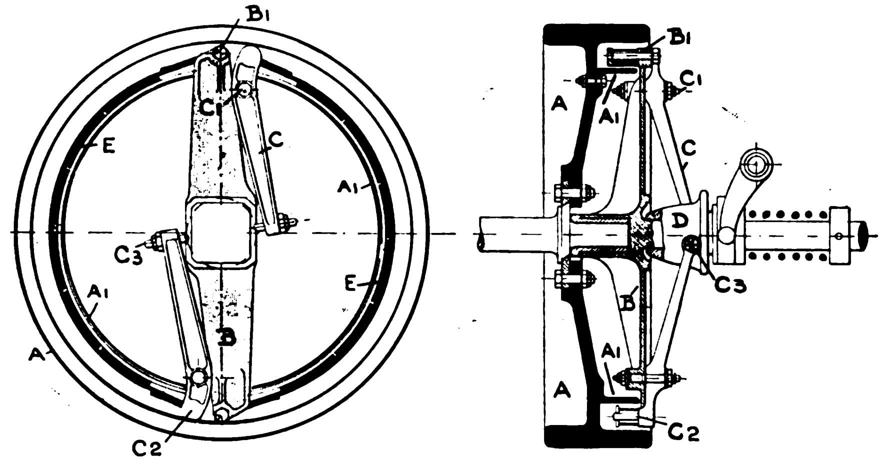
Fig. 3.—The Castle High-Tension Magneto System. View showing the component parts of the magneto in their relative positions. To dismantle the magneto into the state here represented it is only necessary to remove the Bearing Plate, M^1, by withdrawing four screws and to take the driving sleeve, B^2, off the other end of the armature shaft.

(*To be continued.*)

* * * *

THE MORS CLUTCH.

On the new Mors chassis—exhibited for the first time at the recent Paris Salon—the main clutch is, it will be remembered from our Paris Show report, of a different type to anything which has hitherto been in general use. In principle it is merely a shoe-brake, although at first sight it resembles an ordinary band-brake in appearance. Our present illustration shows the details of its construction, but the clutch itself was also partly visible in a photograph which we published on page 1559 of our last volume. Bolted to the flywheel, A, is the drum, A^1, which is encircled by the halves of the brake, E. These thin brake-shoes are anchored, at B^1, to a two-armed spider, B, which forms part of the driven shaft, and, carried by the same member are the two operating levers, C. Each lever is attached to the free end of its brake-shoe at C^2, is fulcrumed at C^1 to the member, B, and rests its long end against the conical wedge, D. The wedge, D, is connected to the clutch-pedal, and is the means of tightening or loosening the brake-shoes about the drum. An adjustment, C^3, is provided on the end of each lever, but these, it will be noticed, require individual setting in order to make the two halves of the clutch grip equally.



THE MORS CLUTCH.—Elevation and transverse section showing the arrangement of the brake shoes, E, about the drum, A^1, and the method of operating them by means of the conical wedge, D, and the pivoted levers, C.

THE 1906 SIX-CYLINDER NAPIER CARS.—PART III.

The Transmission Gear.

CONCERNING the main-clutch it is hardly necessary to give any full particulars, because the clutch fitted to all these cars is of the same design as that of which we gave an illustrated description on February 4th of last year. Its compact form, and the comparatively small size of the fly-wheel that contains it, can, however, be seen in Fig. 3, and it will be remembered that it is somewhat like an ordinary internal cone-clutch having a self-contained spring, except that it runs in oil and has no leather facing. The metal face of the inner member is forced rearwardly against the outer metal member, squeezing the oil from between them, and there are pockets cut at intervals in the outer friction surface to allow the oil to escape or to return quickly as the case may be.

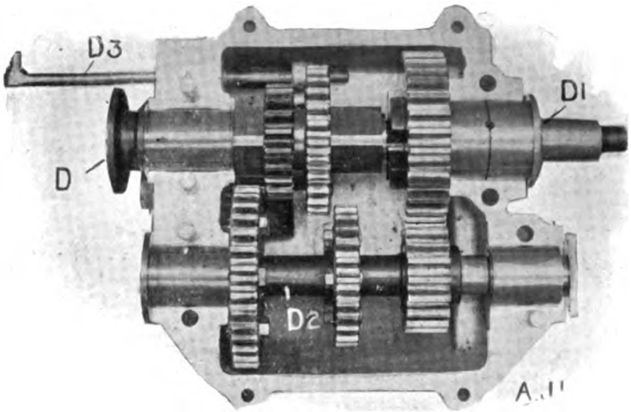


Fig. 4.—View, from above, of the Change-speed-gear employed on the live-axle Napier Cars. The upper portion of the Gear-box has been taken off, and the sliding Spur-wheels are shown in their neutral position.

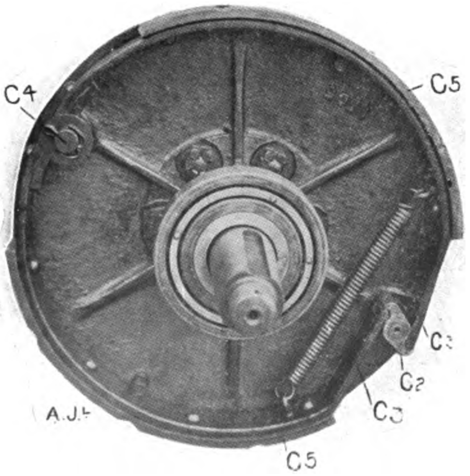


Fig. 6.—View showing one of the Hub-brakes on the 60-h.p. Napier Car. In this illustration the Road-wheel has been removed, and the Live-axle is seen from the end.

Fig. 4 is a view of the lower portion of the gear-box, with the spur-wheels in place inside it. The shaft, D, is that which is coupled up through a short propeller-shaft with the clutch, and the short shaft, D^1, is that to which the long propeller-shaft and the foot-brake are connected; a plain bearing carries the shaft, D, but the other three bearings in the gear-box are roller-bearings. It will be noticed that the shaft, D, is of very substantial proportions with a large square formed upon it for the two sliding spur-wheels that gives the first and second speeds. These wheels are controlled by a rod that is fitted into the upper half of the gear-box, for the rod, D^3, which is seen in Fig. 4, is merely connected to the "reverse" pinion—in the base of the lower casting. A direct drive is obtained on the third (top) speed in much the usual manner by clutching the second speed wheel direct to that upon the shaft, D^1, and the lay-shaft, D^2, is always in gear with that shaft. Simple, strong, and very compact is this entire mechanism, the three forward speeds in which are obtained by a single lever working over a plain quadrant, while a separate small lever is employed for introducing the "reverse." A neat inter-connecting device prevents the reversing lever from being moved except when the main lever is in its neutral notch. For the first speed, the lever has to be drawn rearwardly, while for the second and third speeds it is pushed forwards in two successive stages.

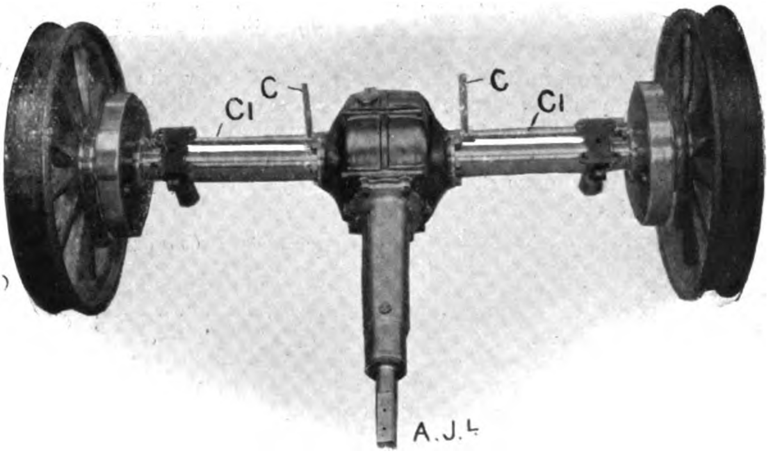
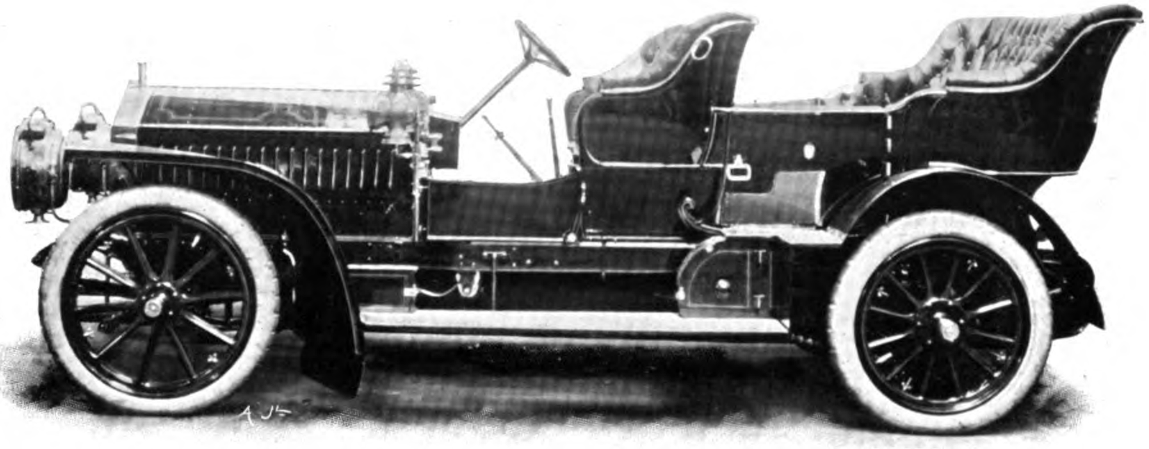


Fig. 5.—The Live-rear-axle of the 60-h.p. Napier Car, complete with its enclosed Propeller-shaft and Hub-brake mechanism.

Usually the standard cars are geared to about 19½, 34½ and 52¼ m.p.h. at 1,600 revs. per min. for England, but can alternatively be geared to 27½, 48 and 72½ m.p.h. for the Continent.

The very neat appearance of the live-rear-axle, with its enclosed propeller-shaft and the brake mechanism for the hub-brakes is well seen in Fig. 5, while in Fig. 6—on a large scale—is an end view with the road-wheel removed to show the arrangement of the expanding brake-shoes, C^5. Inside the axle-tubes the live-shafts run in ball-bearings, but the wheels themselves take a bearing upon the outside of the axle-tubes, and also have ball-bearings.

For operating the hub-brakes, the compensating rods that pass rearwardly from just behind the gear-box are



Side view of the 40-h.p. chain-driven Napier Car.

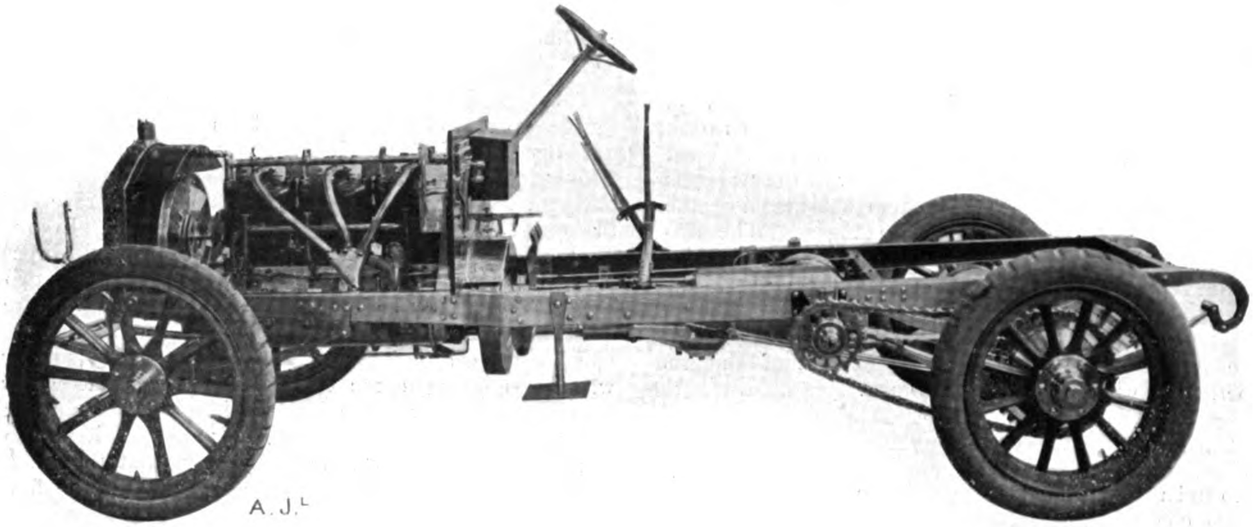
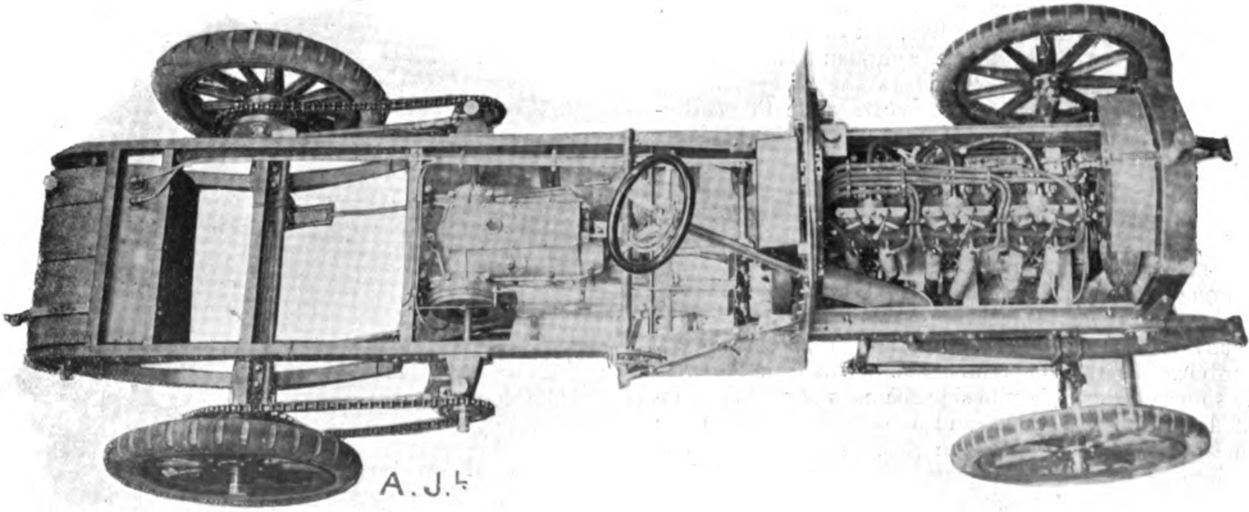


Fig. 7.—The chain-driven 40-h.p. Napier Chassis. Side view with the Bonnet removed, showing the 6-cylinder engine from carburettor side.



Fig, 8.—The 40-h.p. chain-driven Napier Chassis, as seen from above.

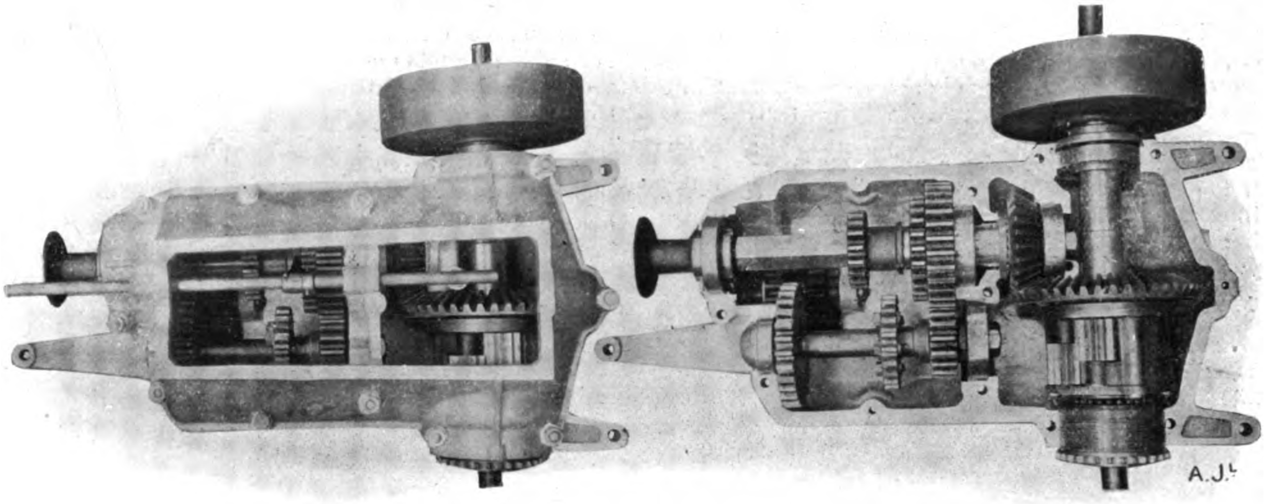


Fig. 9.—Two views of the Gear-box employed on the 40-h.p., chain-driven, 6-cylinder Napier Car.

connected up to the levers, C, and thus the shafts, C', are caused to rock when the brake-lever is drawn back by the driver. On the ends of these shafts are fixed specially shaped cams, C^2, that engage with the two ends of the brake-band, C^3, forcing them apart, against the action of the strong spring seen in Fig 6. The two halves of the brake-band are pivotted to the fixed pin, C^4, and renewable shoes form the friction surfaces. By this construction, a very powerful braking effect is obtained, but a very soft and gradually increasing action is ensured, in place of the fierce seizing that is experienced with some forms of brake.

The 40-h.p. Models.

So full a description was given by us last year of the 40-h.p. chain driven car, that comparatively little need be said about it now, although some minor improvements have been made since then. We, however, give two views showing one of the latest chassis—Fig. 7 being a side view and Fig. 8 a view from above—and we also reproduce in Figs. 9 and 10 photographs of the gear-box and of a hub-brake. The engine has, it will be remembered, mechanically-operated inlet-valves, but they are mounted above the exhaust-valves on the right-hand side, the six separate exhaust pipes that lead to the first silencing-chamber being on that side of the car, while the carburettor with its triple-branched induction pipe leading over the cylinder-heads is on the other side.

The gear-box has, as seen in Fig. 9—where it is shown both with the upper half in place and with that casting removed—a three-point support by which it is fixed to cross-members of the main frame, and both parts of the "through"-shaft, as well as the lay-shaft, run in ball-bearings. The spur-wheels are, in the main, arranged in exactly the same way that they are inside the 60-h.p. gear-box, but the differential countershaft that carries the sprocket-wheels for the side-chains is also accommodated (with ball-bearings and a ball-thrust) within the same box. Consequent upon this, the bevel-pinion is fixed to the short driven-shaft, and it will be realised from Fig. 9, that a second ball-bearing supports the extreme end of this shaft, behind the bevel-pinion. There is thus no overhang to set up any "dithering"; the end-thrust of the pinion is taken by a ball-thrust.

There is another constructional difference between this gear-box and that employed on the live-axle cars, for, instead of there being only one intermediate "reversing" pinion, there are two, and, instead of having a separate lever for introducing the "reverse," the one change-speed lever only is required. In our photographs, the gear is shown in its third speed (direct drive) position, but it will be understood that as the two sliding-wheels are moved forwards along their square shaft, the larger wheel first engages with the second speed wheel on the lay shaft, and then, after the smaller wheel has engaged the first speed wheel, that wheel comes into mesh with the foremost intermediate pinion; that pinion being shrouded on its front face, it is also caused to slide forward, the result being that the other intermediate pinion is brought into gear with the first

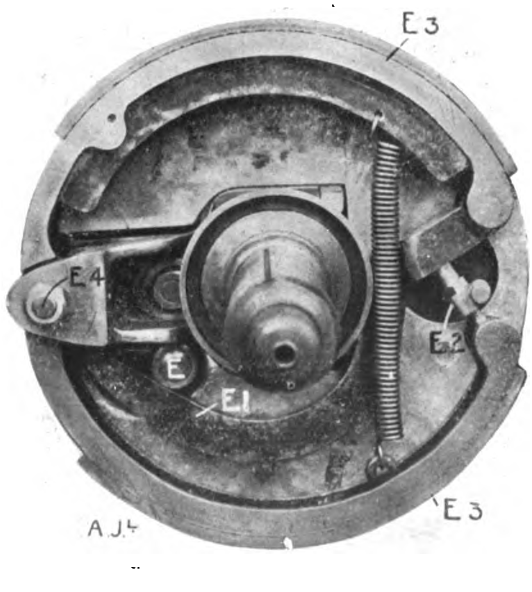
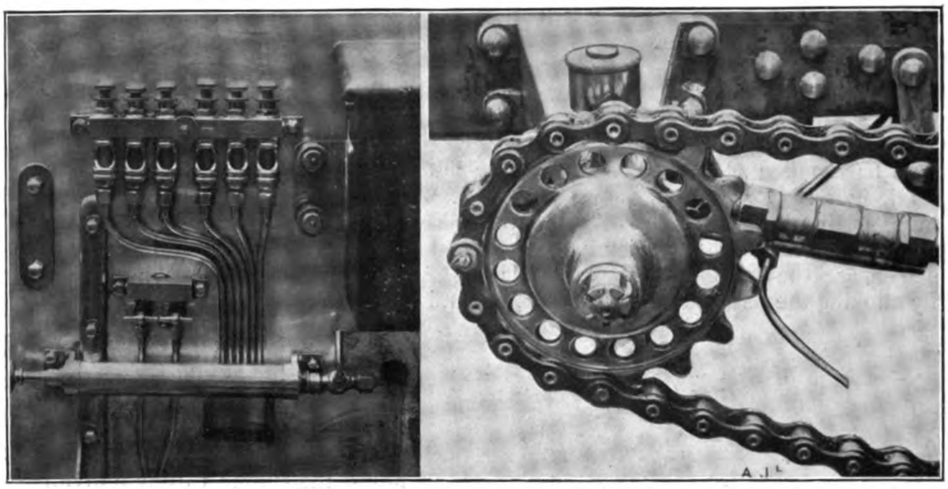


Fig. 10.—One of the internal expanding Hub-brakes, fitted to the chain-driven, 40-h.p. Napier Car. View looking at the end of the Rear-axle, with the Road-wheel removed.



Figs. 11 and 12.—Two views showing the lubricating arrangements on the dashboard, and in the neighbourhood of the sprockets, respectively, for oiling the side chains on the latest 40-h.p. Napier Cars.

speed wheel on the lay-shaft. The differential-gear with its spur planet-wheels will be recognised in Fig. 9.

Referring to Fig. 10, the construction of the hub-brakes on this car can be easily followed. In this design it is the rock-shaft, E, that is actuated by the hand-lever, and the special cam on the end of this shaft that forces down the lever, E^1. This lever is pivoted to the upper brake-shoe, E^3, and there is an adjustable toggle-link, E^2, between it and the lower brake-shoe. In this way the lever, E^1, causes the brake-shoes to separate against the action of the spring, forcing the shoes outwardly against the surrounding brake-drum. Both shoes are pivoted about the fixed pin, E^4.

Quite recently, a new device has been adopted for lubricating the side-chains from the dashboard; this arrangement is well illustrated in Figs. 11 and 12. As will be seen in Fig. 11, there are two cocks fixed to the dashboard, just below the sight-feed lubricator, and from them pipes are led to the positions shown in Fig. 12. Oil can thus be fed on to the chains while they are running, and any tendency that they may have to become noisy can be instantly checked; the feed may either be continuous or intermittent, as desired.

For the live-axle 40-h.p. car, the same engine is used as for the chain-driven model, but the gear-box is identical with that on the 60-h.p. vehicle. It, however, is geared slightly higher than the chain-driven car (though considerably lower than the 60-h.p. machine), the gears normally giving about 17¾, 30, and 46 miles per hour as against 14¾, 27¾ and 44 m.p.h.

Conclusion.

Such then are the 6-cylinder Napier cars which have created so much stir in motoring circles during the past year or so, and particularly—in a more or less controversial form — quite recently. That they should have done so is by no means surprising when one considers the remarkable capabilities of *all* the modern vehicles that are now being turned out by the best known makers, and the extraordinary degree of perfection which has been reached so rapidly by the united efforts of those most interested in the motor industry.

So good are many of the 4-cylinder vehicles on the market that many people naturally deem it impossible to obtain anything better, and feel that the extra cost of a further couple of cylinders can hardly be justified in actual practice. Further than this, it could never have been a foregone conclusion that six cylinders could be made to run in such absolute unison with one another as to enable the engine to run as do those built by the Napier Company.

On the other hand, however, it is clear that for engines of the same power, those having six cylinders can be made with lighter pistons and need not have such heavy flywheels, it being fair to conclude, therefore that—so far as the weight of the reciprocating parts *per cylinder* are concerned —that the 6-cylinder engine ought to be able to run at a higher piston-speed, and that it ought to be able to vary its speed more quickly. There is, too, a further important point to be taken into consideration by those studying the question from a general point of view. At any load and at any speed, the force of each impulse (the maximum torque) is less than with four cylinders, and the torque required to overcome the negative work (compression) never reaches as high a value. Not only therefore can the engine run faster, but it can also run at slower speeds without the individual impulses being felt, while it also follows that the intensity of the driving strains in every part, from the crankshaft to the tyres, and the extent to which they fluctuate in a regular periodic manner, should be materially lessened. Less wear and tear should consequently take place throughout those portions of the car, while at the same time the life of the tyres should be prolonged appreciably. Apparently cost of production is the chief factor which can be urged against such cars, but obviously those who buy 6-cylinder cars require powerful vehicles, and do not object to the extra cost.

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"The Gentleman Chauffeur."

ATTENTION has often been drawn by this journal to the extent to which young men of good position are adopting the motor car profession, either as a livelihood or as a means of obtaining a wide outlook on life. An amusing instance in point is provided by the reported experiences of the present Bishop of Worcester, or perhaps it would be more correct to say of his lordship's wife Lady Barbara Yeatman-Biggs. The Bishop had engaged a gentlemanly and thoroughly capable young man as chauffeur, and Lady Barbara was making a number of calls in the episcopal car, when at one house included in her "visitation" she was surprised to see the hostess come out and shake hands with the chauffeur and invite him in to tea. This he declined, saying that at present he was only the chauffeur, but Lady Barbara, on making enquiries, found that he was a youth of excellent social position and an old friend of the family on whom she was calling.

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THE WINTON LUBRICATOR.

In our recent description of the new 25-h.p. Winton car, we referred to the Winton Precision Oiler with which it is fitted; we now give a description of this device, together with various photographs which we have taken of its component parts. This lubricator is designed to force oil under pressure direct to any number of bearings with which it may be connected, and its action is such that only one pipe is fed at a time—which ensures the clearing away of any obstruction temporarily choking the passage of the oil. In principle, the Winton lubricator is similar to the Albion lubricator, which we described in our issue of September 16th, 1905, but it differs from it in various details of operation. Inside the case, A, which acts as a reservoir for the oil, is a plate, A^1, carrying all the mechanism. Beneath this plate is the pump-casting, B, which has a conical face, B^1, in order to enable it to make an oil-tight joint with a corresponding seating on the bottom of the case, A. Oil is delivered, through a small hole in this facing, from the pump cylinder, B^2, immediately above it, and the plunger, C, itself is operated through the rock-lever, C^1, by the spring, C^2. There is only one pump, but there are, in this particular lubricator, eight feed pipes; in order to supply oil to each, therefore, the pump is rotated bodily, so that its delivery port comes opposite to each in turn. The lubricating motion can be effected from the engine by an eccentric rod mounted on a projecting end of a cam-shaft. The eccentric rod is coupled up to the crank, D^3, thus transmitting an oscillating motion to the bevel-wheel, D^2, which engages with the bevel-wheel, D^1, and this in turn imparts, through the agency of the free-wheel clutch, D^1, an intermittent rotary motion to the worm, D, and worm-wheel, B^3, the latter being directly connected to the pump-casting, B.

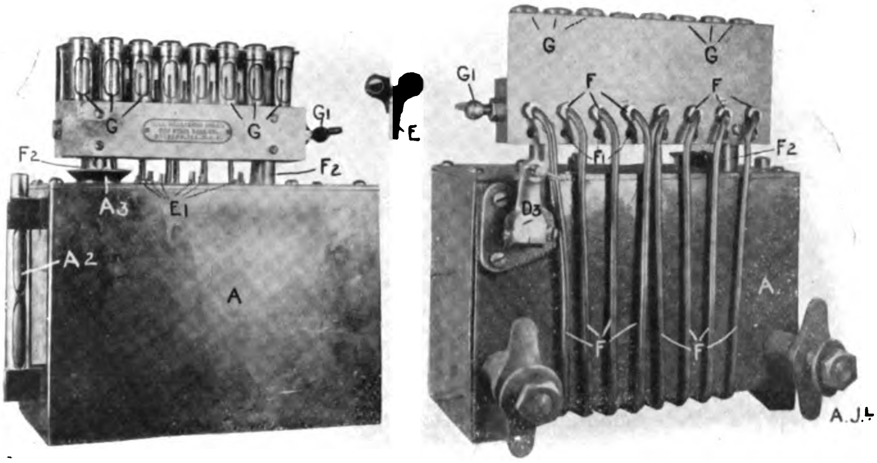

Fig. 1.—The Winton Lubricator.—Views from the front and back of the complete apparatus. Above the Reservoir, A, is the Sight-feed-fitting. Oil is delivered under pressure to each pipe separately, the mechanism being coupled up to the engine by a rod connected to the Crank, D^3. Between these views is seen the Key, E, by which the feed to each pipe can be adjusted.

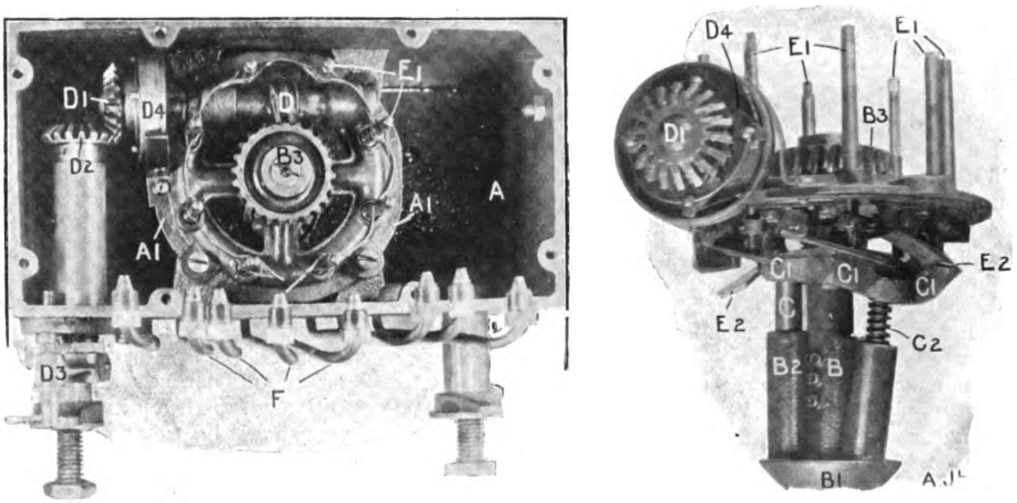

Fig. 2.—The Winton Lubricator.—View of the Interior, showing the mechanism in place; also another view (on the right), showing the mechanism separately.

As the pump-casting revolves, one end of the rock-lever, C^1, is caused to slide along the face of one of the inclined plates, E^2, in doing which it compresses the spring, C^2, and raises the plunger, C. Arrived at the end of the plate, it then suddenly slips off, and the spring, C^2, being thus released, forces down the plunger which delivers the oil under pressure to one of the feed pipes. By means of a small key, E, it is possible to instantly adjust the supply to any individual pipe, for by using the key to turn one of the spindles, E^1, which project through the case, A, the slope of the plate, E, connected to it can be altered, and the height to which the pump-plunger rises is varied accordingly.

From the bottom of the reservoir, the oil-pipes, F, pass up to a sight-feed fitting mounted above the case, A. Normally, however, no oil is visible in the sights, G, because there is a direct connection from the feed-pipes, F, to the delivery pipes, F^1, and it is only when the tap, G^1, is turned on that the oil-feed is visible. At such times, however, the oil does not go to the bearings at all, but only runs back to the reservoir through the drain-pipes, F^2, so that the tap, G^2, must not be left open longer than is necessary to ascertain that the pump itself is working properly.

Table of Reference Letters for the Winton Lubricator.

A	Tank.
A^1	Bracket.
A^2	Gauge.
A^3	Filler cap.
B	Pump casting.
B^1	Coned facing.
B^2	Pump cylinder.
B^3	Worm wheel.
C	Plunger.
C^1	Rock lever.
C^2	Spring.
D	Worm.
D^1	D^2, Bevel wheels.
D^3	Crank.
D^4	Free-wheelclutch.
E	Key.
E^1	Adjustment spindles.
E^2	Inclined plates.
F	Feed pipes.
F^1	Delivery pipes.
F^2	Drain pipes.
G	Sight feeds.
G	Tap.

AERONAUTICS.

Denmark Rivalling America.

If we can credit accounts which have appeared in the European Press of doings in Denmark, an aeronaut of the name of Ellehommer has built an aeroplane of which no particulars have been divulged, but one cannot help thinking that it is more or less on the Wright lines. The apparatus was provided with a motor and propellers, and was mounted by Herr Ellehommer, the motor was started, rose slowly in the air and advanced against the wind for a distance of 50 metres, when the intrepid experimenter stopped the motor and descended gently to the ground without damaging the apparatus in the slightest.

The Significance of the Experiment.

This experiment, if confirmed, is of very high interest indeed, and of very excellent promise of future accomplishment. Herr Ellehommer declares that he is so satisfied with the experiment that he hopes in a short time to be able to give a demonstration to which he will invite the Press of all countries. That he has accomplished a feat of the kind described we are the more prepared to believe, as it bears such a striking similarity to the first experiment made by the Wright Brothers with their motor-driven machine. In fact, it may be said that the position of the aeroplane at the present moment is rather like that of the motor bicycle when first introduced. It is certainly very advantageous for anyone who desires to ride a motor bicycle to have already been accustomed to riding an ordinary machine, but we are far from feeling sure that it is an *indispensable* preliminary condition. There is so much in knowing that the thing can be done. The experiment of Herr Ellehommer suggests that it may ultimately be found that preliminary practice in "gliding" is no more absolutely necessary than ability to ride an ordinary bicycle is indispensable for the man who aspires to the motor-driven machine. It is, in fact, quite possible, that to accomplish a successful glide from a hill top against a moderate breeze may be really more difficult than to learn to control a motor-driven aeroplane. The conditions, at any rate, under which the experiment can be successfully performed will be harder to attain. You must not only have the right aeroplane and the right kind of hill, but you must also have the right kind of breeze blowing against you. Where you have the motor on board, the latter requirement is, at any rate to a certain extent, eliminated. At any rate, we believe the success alleged to have been accomplished by Herr Ellehommer demonstrates what we previously maintained, viz., that half the difficulties of a new problem are eliminated when it has been proved that its solution is possible.

Experiments by Towing with a Motor Car.

To experiment with an aeroplane by having it towed by a cord from a motor car going at high speed is a form of tackling the problem which naturally appeals to a good many people, and we believe that we have ourselves on one occasion, at least, suggested it as worth trying. We are not now at all convinced that it is really a good method to adopt, because the towing cord, which represents the string of a kite, not only gives propulsive force, but also stability, and the problem, of course, is to accomplish stability while provided with propulsive force only. However, the experiment has been tried on the Ormond-Daytona beach, which is just the place one would select for trying it. Unfortunately, the aeroplane broke either itself or its rope—probably the rope—when raised to a height, by the motor car towing it, of 200 feet above the beach. It accordingly fell to the ground, but it is a remarkable evidence of the excellent nature of the Ormond-Daytona beach, and its suitability for experiment of this kind, that the experimenter did not suffer any worse injury than a severe shaking.

Recklessness not Necessary.

Of course, the experimenter had no business to go up 200 ft. What (if anything) he could have learned about the controllability of an aeroplane under such circumstances, would have been provided by keeping at a much lower altitude. If he was unable to do so it would have proved that his control was imperfect. He should have been able to keep his machine from going up so high; that is to say, if it was nearly as controllable as it ought to have been, instead of rising to a dangerous height like this he ought to have been able to maintain himself at from 20 ft. to 40 ft. in the air with a diminished pull on the motor car. The experimenter may think himself lucky in getting off so lightly. He says he intends to resume his experiments. We trust that if he does so he will be careful not to let his machine rise so high in the air, or if he is unable to prevent it from doing so, that he will arrange with the motor car to slacken speed as he rises.

Santos Dumont at Work.

M. Santos Dumont is getting on with his *helicoptere* and the machine is now actually being constructed in his workshops at Neuilly. It also appears that M. Santos Dumont has some intention of using an ordinary aeroplane, if we can speak of such novel machines as "ordinary." Should the experimenter give an equally favourable trial to both types of machine, we have little doubt as to which will emerge as the more successful. In the meantime the proposals which have been made to M. Santos Dumont to engage in an expedition to the North Pole with an airship of the navigable balloon type, if they ever materialise, will show whether that type of machine can accomplish what has hitherto proved an insoluble problem for all other methods of locomotion.

The South Pole not to be Neglected.

Proposals are now being put forward to attempt the conquest of the South Pole by somewhat similar means, and it is understood that the Count de la Vaulx is co-operating with Dr. Charcot, who has had considerable experience in Antarctic exploration, with a view to a combined attack on the Pole, in which airships, or more or less navigable balloons, will co-operate with sledges or other means of transport. The Count de la Vaulx, it will be remembered, has carried out a series of very instructive experiments, mostly on the Mediterranean, for the purpose of demonstrating how far ordinary balloons can be made navigable balloons by a triple system of floats travelling on the water, and also by means of motor propulsion. He is a thoroughly serious experimenter, about whom there is a conspicuous absence of "blague," and his participation in an Antarctic expedition is not likely to occur on anything but the most substantial and carefully considered lines.

Whether ultimately successful in its end or not, it will be almost certain to add considerably to our knowledge of the Antarctic problem. That a thoroughly serious and determined attempt will be made is shown by the fact that the Count de la Vaulx intends to spend some eighteen months in preliminary experiments and arrangements before actually commencing the real expedition, which he estimates will occupy some three to five years. Of this period some two years will be spent on the Antarctic Continent before the first attempt to reach the pole is made.

Count Zeppelin Again Unlucky.

COUNT ZEPPELIN took his navigable balloon out last week for the second time on Lake Constance, and passed over Ravensburg, Kisslegg, and Sommerstadt, ultimately descending at Allgau. A storm which got up during the experiments seriously damaged the machine, and it will be some months before it will be able to again take the air.

The Aero Club Wakes Up.

AMONG the results of increased general interest in aeronautics to which our efforts have, we hope, to some extent contributed, the Aero Club of the United Kingdom has appointed an influential council, consisting of the following members:—

Field-Marshal Earl Roberts, K.G., &c., Lord Suffield, Lord Howard de Walden, Lord Kinnaird, Lord Llangattock, Lord Montagu, Admiral Sir Charles Campbell, Bart., Sir David Salomons, Bart., Admiral Sir Edmund Fremantle, Admiral Sir E. Seymour, G.C.B., Gen. Sir R. Hart, V.C., Maj.-Gen. Sir Henry Colvile, Sir William Crookes, F.R.S., Prof. Sir Norman Lockyer, K.C.B., &c., Sir Hiram Maxim, Count de la Vaulx, Vice-President Aero Club de France, *Senhor* Santos Dumont (hon. member), in addition to the members of the committee, *ex officio*.

The club has further decided to hold dinners (at a moderate cost) once a month at the Florence Restaurant in Rupert Street, which will be open to members and their friends. The dinners will be held the first Tuesday in each month, after the committee meetings, and will be followed, we presume, by discussion on aeronautical matters.

Ill-advised Enthusiasm.

WE are as enthusiastic as any people can be as regards the solution of the aeronautical problem, and the conquest of the atmosphere. For that reason alone we desire to protest against the exuberant language of some people who allow imagination to outrun discretion. We refer particularly to the remarks attributed to Mr. Alexander Graham Bell, at a dinner of the Automobile Club of America, who predicted that the problem of aerial navigation would be solved soon, and that man would be able to dine in Halifax, Nova Scotia, and breakfast next morning in London. To do Mr. A. G. Bell justice, he refrained from saying precisely when this prophecy would be realised, but believed that the solution of the problem would come suddenly. It is possible, of course, that it may come more quickly than is generally expected, but probably those who contribute most markedly to its solution will not have their thoughts mainly concentrated upon dining in one place and breakfasting in another.

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Mr. Edge as Politician.

To his many other great gifts of organisation, motor car driving, and business management, Mr. Edge, as all who have heard him will be willing to admit, is a singularly able public speaker. He gave proof of his quality in this respect under distinctly disturbing circumstances at a recent political meeting at Reigate, where he spoke in favour of tariff reform, needless to say, as he understands it, *i.e.*, the imposition of tariffs imposed on finished manufactured products produced by foreign skilled labour. Without either agreeing or disagreeing with the views which Mr. Edge propounded, it is impossible to deny not only that he put them forward in his usual straightforward and convincing manner, but that he displayed a singular gift of dealing with a hostile or partially hostile audience. Received at first with interruptions so numerous that they threatened to render his speech abortive, he ultimately succeeded in getting the large and far from friendly audience almost completely on his side, and the closing portions of his speech were listened to with attention amounting almost to enthusiasm. This is not merely a personal triumph for Mr. Edge, but a marked example of his many-sidedness, which has been a source of admiration to all connected with the automobile movement and to many outside it.

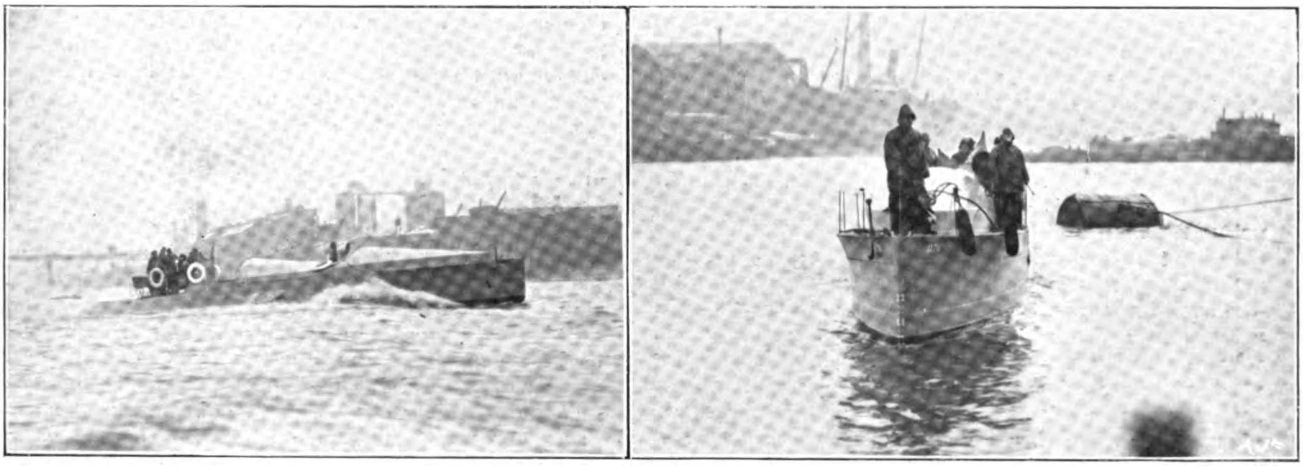
The Hilarious Burglar.

IF we went in for thumbnail sketches to illustrate the subject matter of our pages, we would place alongside of this paragraph a sketch of a burglar armed with the accoutrements of his profession—for example, "a jemmy sables on a field gules" dancing a jig, or otherwise giving expression to a feeling of satisfaction with things in general. For the burglar appears to have been having quite a grand time of it in the Walton district of Surrey, and this is locally attributed to the concentration of the police force on police traps—we beg pardon, motor traps [alias "coppermines" (*Punch*)]. It is, of course, impossible to expect policemen to be camping out on the roadside and disguising themselves as rustics, and sometimes as gentlemen, playing Pan's pipe under the widespreading branches of an umbrageous beech, or poking their heads out of pigstyes so as to be mistaken for the natural occupants, and then to be able to go home at night and exercise proper vigilance over the houses which they are paid by the ratepayers to protect from the enterprising followers of Bill Sykes. Small wonder that they have not been able to accomplish both tasks, and that the number of successful burglaries which have in consequence been carried out in the Walton district has caused a resident, Mr. Hume, to address the District Council and "call attention to the recent burglaries in the district, and move that the Clerk should ask for an increase of the police force in the district." This is highly instructive, for if such a proposal is generally adopted the cost of the police in England will soon become almost as great as in Ireland. Of course, we know that the fines raked in by police traps—we mean motor traps—goes to alleviate the rates; but if the result is that an increase in the police force is necessary so that we may have a day shift to man the police traps—we again beg pardon, the motor traps—and a night shift to look after the burglars, the advantages derivable from the fines inflicted on motorists will soon disappear. Perhaps the recognition of this feature of the situation will ultimately lead to more sensible management on the part of those responsible for the organisation of the police.

THE YARROW-NAPIER TORPEDO BOAT.

AFTER the remarks made by Mr. Yarrow on the virtues of the motor boat at the trials of Napier II., which we reported in our issue of March 11th last year, it was hardly to be expected that his famous firm would for long remain indifferent to the more utilitarian side of the high-speed motor boat industry. With such firms as Messrs. Yarrow, the utility of a boat is naturally more or less synonymous with its fighting capacity, and it came as no surprise, therefore, to learn that they had recently constructed a trial "second class" torpedo boat, which is propelled entirely by petrol engines. It is probably the most powerful petrol boat yet built for a "useful" purpose, and the constructors are undoubtedly to be congratulated on the manner in which it has shaped in the trials recently carried out in the Thames.

No one can say that the modern "second-class" torpedo-boat has what is popularly termed a "business-like" air. Its professional services require that it should be as inconspicuous as possible—a mere wasp, in fact, among the naval swarm. So with "1176"—as the new boat is at present known—there is very little of her, a turtle deck, a hurricane hood, and a streak of grey, and even these signs of substance are lost while the boat is yet skimming along in the near distance. It may be explained, for the benefit of those who are unversed in the precise appellations of each class of boat in a fleet, that torpedo-boats are of two classes, the primary difference between them being overall length. "1176" is 60 feet long, and is, therefore, in the "second class"; her beam is 9 feet, and she has already attained a speed over the measured mile of 26¼ knots. Previously, the best speed that could be expected from a boat of this type, propelled, of course, by steam machinery, was about 20 knots, so that there is thus a clear gain of some 6¼ knots by the mere substitution of the internal combustion engine for the steam plant. With this increase in speed, it may be mentioned, the second-class boat would be comparable with the considerably longer craft, which now figure in the first class. This advantage Mr. Yarrow attributes to the following causes:—"Firstly, the much lighter weight of the machinery of the internal combustion type as compared with steam, probably the saving in weight is 50 per cent.; secondly, the form of hull, which at these extreme speeds (for the displacement of a boat of this type) seems to enable it to rise on the surface of the water, and, as it were, to some extent slide upon the surface. This is made evident by the smallness of the surface disturbance of the water, which is very remarkable. Thus the portion of the power which is usually expended in producing surface disturbance, or what is called 'wave-making,' is utilised for propulsion." There is no doubt that this lucid explanation is upheld by appearance, even to the lay mind. The boat makes very little fuss either fore or aft, although, of course, she cuts through more "solid" water than did Napier II., which was a purely racing boat.

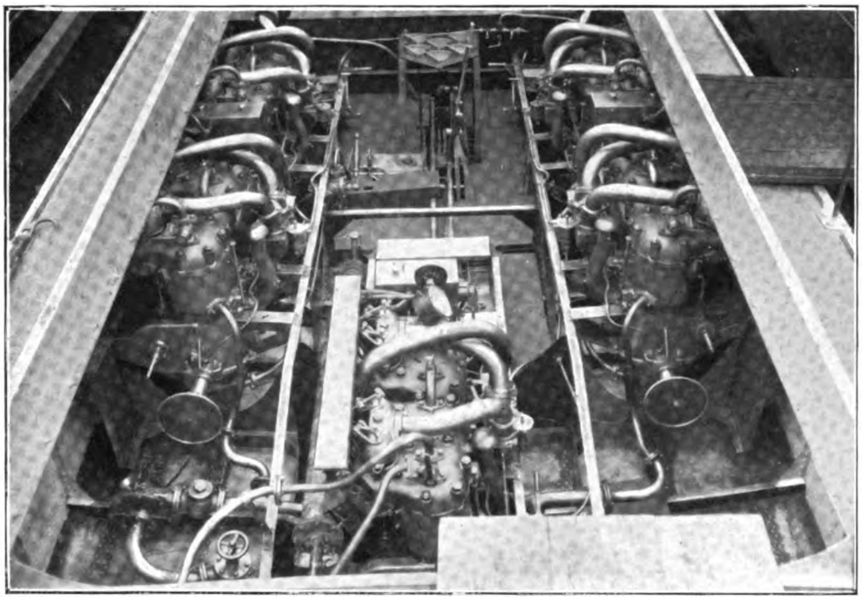


THE YARROW-NAPIER MOTOR TORPEDO BOAT.—"1176" at speed and at rest. On her trials this 60-ft. boat made a speed of 26¼ knots over the measured mile. When travelling her fastest, the fore part of the boat rises slightly out of the water, and at times about one-tenth of her overall length is entirely above the water line.

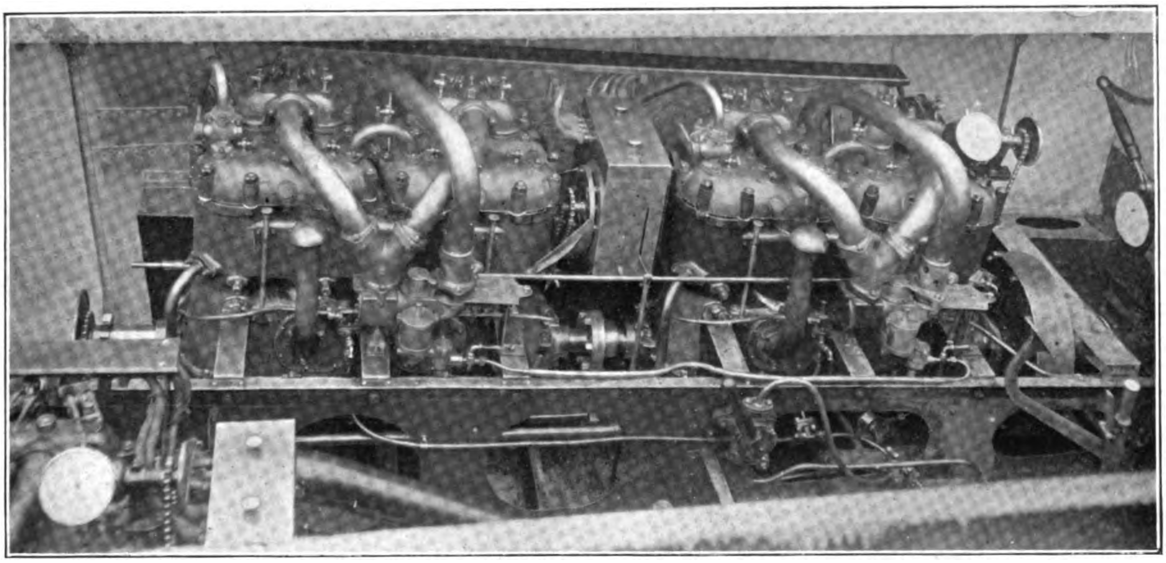
Our photographs give a very clear idea of the lines and construction of the new boat, although the skeleton condition in which she underwent her speed trials gives no indication of her final appearance when fully equipped with torpedo tube and quick-firing gun. The steel hull (the plates of which vary from 8 to 20 gauge in thickness) is divided by four bulkheads, those fore and aft being close up to the bow and stern respectively. In the central section is placed the propelling machinery, which consists of three engines, two of which have eight cylinders each, and drive the outside propeller-shafts, while the other engine—which lies further forward—has four cylinders, and drives the middle propeller. Each of the port and starboard engines in reality consists of two 4-cylinder units coupled together; thus, in all, there are five identical 4-cylinder engines which are similar to the Yarrow-Napier set exhibited at Olympia.

Although designed by Mr. Napier, and closely following well-known Napier practice, the engines are made by Messrs. Yarrow in their own works. All four cylinder jackets, together with the upper half of the crank-chamber are cast in one piece (of gunmetal), and cast-iron liners are forced into these jackets in order to form the cylinders. Bolted above them are the cylinder-heads, which are cast in pairs. The inlet-valves are placed over the exhaust-valves, and are operated by push-rods and rock-levers from the same cam-shaft.

In every respect these engines have been made mainly

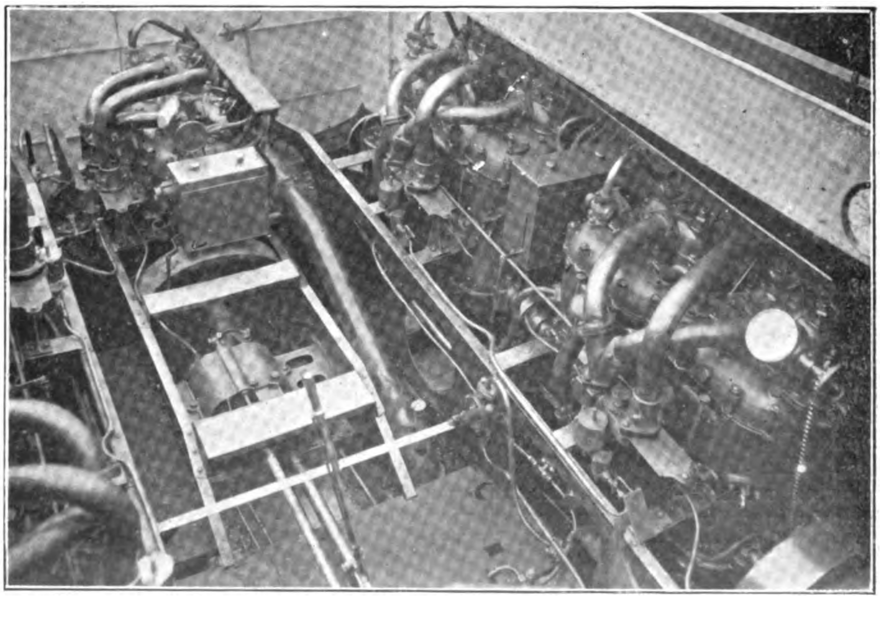


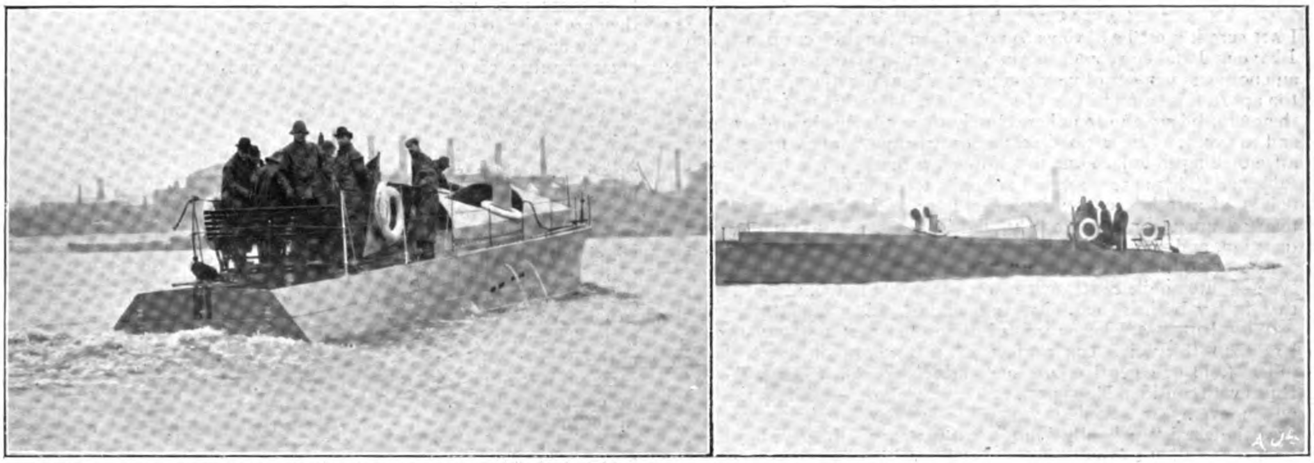
THE YARROW - NAPIER MOTOR TORPEDO BOAT.—View of the engine room looking aft. In the foreground is the central engine which is used for manœuvring and reversing, and at the far end the control table, which carries the ignition and throttle levers, is visible. Each of the "wing" engines consists of two four-cylinder Yarrow-Napier marine sets which are coupled together to form an eight-cylinder engine. The central engine, however, is a single four-cylinder unit. In all, there are, therefore, twenty cylinders, and the power available for going ahead is about 300-h.p.



THE YARROW-NAPIER MOTOR TORPEDO BOAT.—View of the starboard engine.

THE YARROW - NAPIER MOTOR TORPEDO BOAT.—View of the engine room, looking forward, showing the reversing gear behind the central engine. The plate bearers which support the engines are a noticeable feature in the construction of the boat. In appearance they are exceptionally light, but those for the "wing" engines run right through the bulkheads, and so add considerably to the general strength of the hull. The engines have gun-metal cylinder-jackets, cast in one piece with the top of the crank-chamber, fitted with cast-iron liners, separately water-jacketed cylinder heads are provided, and these are cast in pairs.





THE YARROW-NAPIER MOTOR TORPEDO BOAT.—Two views of the boat taken while she was making her trial runs in the Thames. The shape of her squat stern and her general broadside appearance are well illustrated by these photographs.

with a view to extreme strength and durability, and they are, therefore, somewhat heavy for their power—from the automobile standpoint. The total weight of the machinery is about 3 tons. Each 4-cylinder set develops about 60-h.p. at 1,000 revs. per min. There is thus about 300-h.p. available for steaming ahead, but only the central engine is used for reversing, as it is not considered necessary to complicate the machinery by fitting reversing gears to the other motors. For ordinary manœuvring in dock, too, the single engine is exceedingly handy, and altogether the disposition of the engines seems to have much to commend it, more especially since, even with only 9 ft. beam, the engine-room is anything but cramped. Cone clutches are employed behind each engine, but these are supplemented by jaw-clutches behind the wing engines in order to enable the propeller-shafts to be permanently disconnected from the crank-shafts when required. The reverse gear behind the central engine is of the ordinary sliding spur-weel type. When starting, the central engine only is got under way by hand, and the speed of the boat itself is relied upon to start the port and starboard engines by the turning effort exerted by the propellers as they are dragged through the water.

Fuel is carried right aft and the tank is separated by a watertight bulkhead from the rest of the boat.

Another “Argyll” Innovation.

Nothing is being left undone by the energetic managing director of the London Argyll Company—Mr. E. H. Watson—both to bring the well-known vehicles manufactured by his firm into prominence with motorists, and to ensure the continued satisfaction of all customers long after they have purchased their cars. Their business is, in fact, being carried out on remarkably enterprising lines, for not only can those who require cars actually select one from stock in the London show rooms, but now Mr. Watson is arranging for periodic examination to be made by his own inspecting engineers of every car sold by him, as long as it remains in use. Each owner will be given an opportunity of having his car thoroughly examined at intervals of about two months, and will on each occasion be supplied with a report specifying the condition of each and every part. Except as regards the actual travelling expenses to a distance, no part of the cost is to be borne by the owner of the car. There is, we think, little doubt that the majority of owners will thoroughly appreciate this beneficial innovation, for hitherto one of the only real difficulties which many people have experienced has been that of ascertaining whether their cars are being properly looked after or not. All motorists sooner or later realise that the life of their cars, and the dimensions of their repair bills, depend to an enormous extent upon proper care at the proper time, and that most heavy expenses which are incurred in replacements of parts, might in nine cases out of ten have been saved had the necessary adjustments been made at the time that they were required.

Although this new scheme involves a considerable and continuous expenditure of money on the part of the company—so much so that only a large firm doing an extensive business could undertake it—Mr. Watson has very carefully considered it in all its bearings, and is quite satisfied that it is commercially sound. The chief advantage to the makers is that they secure satisfied customers, that they are relieved of the work caused by trivial complaints from correspondents, and that they keep themselves in such close touch with their clients as to know at all times the exact respects in which modifications in design can be made to advantage when bringing out new models for the following year. From the purchaser's point of view there is, in addition to the more obvious merits, the very great advantage that little difficulty would be experienced in obtaining a good price for their cars, if at any time they wished to sell them; the periodical reports in themselves would go a very long way towards overcoming any of those difficulties which are at present met with when selling secondhand. It is just such schemes as this that do so much to popularise automobiles with the general public, and it is particularly satisfactory that a British firm should be giving so strong a lead in this direction.

Price of Fuel Goes Up.

As from January 19th, we are informed the price of all grades of naphtha, including motor spirit, has been advanced 1*d.* per gallon. Even with this advance, we believe the cost still remains below that ruling during the first few years of the industry.

THE TOURIST TROPHY.*

I AM sure it must be obvious to you all that the subject upon which I have undertaken to address you this evening is one that involves an enormous number of very complicated considerations, and is only too apt to raise a multitude of side issues. For this reason it will, therefore, be my aim to adhere closely to a clearly defined course, and to avoid, as far as possible, the many temptations that inevitably arise tending to induce one to follow cross roads which lead to pet subjects. There are, too, as I am only too painfully aware, some points of a rather contentious character which will have to be touched upon; but, fortunately, the Tourist Trophy is not a party question, and since this is not a political platform, I may admit at once that nothing in the nature of perfection can be claimed for any type of automobile contest whatever. When I tell you, gentlemen, that in my business capacity as technical editor of THE AUTOMOTOR JOURNAL I have received during the past four months no less than thirty-five square feet of manuscript in the form of letters from one gentleman alone, criticising the Tourist Trophy Rules with considerable vigour, and even violence—each square foot on an average containing 410 words—you will understand why I used the word "painfully" in my last sentence. It may, however, be a consolation to you to know that his criticisms are now partly directed against THE AUTOMOTOR JOURNAL for its narrow-minded short-sightedness in failing to take advantage of so much "cheap copy." And this brings me to a final preliminary explanation which it is only right to include in this brief introduction. Most of the time which I have been able to devote to a study of this subject has been on behalf of the journal with which I am connected, and I therefore feel that no apology is needed if I refer for some of my facts and figures to its pages. Personally, I have to thank the proprietors of that paper for permission to use the special tables which they have published when endeavouring to interest their readers in the Tourist Trophy question, as well as for the loan of certain photographic illustrations.

To begin at the very beginning, it is necessary to first ask whether, nowadays, anybody really wants automobile competitions at all, and even this question is somewhat of a "poser." Speaking in general terms, most manufacturers do not want to be bothered with them, but, on the other hand, I am inclined to think that the public undoubtedly wish for some such guide to enable them to decide which cars to purchase, and would even more strongly advocate and support such contests if they could be organised as purely sporting events, free from all trade influences. It almost appears as though we have reached a stage at which the motoring public would have been able to relieve the manufacturers of the cost and anxiety of all such contests if any thoroughly satisfactory kind of competition for touring cars had been well established on accepted lines already. Nothing of the kind has, however, hitherto existed, and consequently the private owner is still waiting for the trade to show him how to enter into friendly competition with his friends when they go for spins together. I think there can be no doubt but that all manufacturers would benefit largely if only they could find a way of overcoming this initial difficulty, and that they would then find it to be well worth their while to hold one great professional contest each year amongst themselves, in order to maintain a set of standards for the private motorists to work upon. It is difficult to conceive of anything that would tend to give a better education to the public on the proper management of their cars than this, for the man who habitually takes hills with his spark fully advanced, or frequently starts off on a day's run with his brakes partly "on," would soon learn why he—not his car—was at fault. It is, I think, quite safe to say that neither manufacturers nor their agents want to take part in any such events, and that most of them have only done so in self-defence in the past. I do not suggest that the local contests need even be held on precisely the same lines as the great annual competition, for clearly it would be impossible for the roads to be appropriated in the same way to suit their convenience. It would not, however, be difficult to draw up corresponding rules free from all such objections.

Assuming, then, that competitions are required for the reasons just given, it may next be maintained that they should be organised simply and solely for such cars as are built for ordinary use, and that the rules governing them should, so far as possible, rigidly exclude everything in the nature of special machines designed and built merely to win such contests. It should also, I think, be taken as an axiom that the rules ought to discourage any method of driving which is calculated to have an injurious effect upon the durability of the mechanism. We practically have to then consider what type of contest is most useful, and the first point that arises is whether it should be of short or long duration. Clearly, short duration trials are preferable if they can be rendered effective, for they more nearly approach the requirements of provincial clubs, they are easier to conduct in a thorough manner, and they are more readily understood by everyone. In the past, those lasting over a great number of days unquestionably had their overwhelming advantages, for not only did they enable a great number of people in out-of-the-way districts to actually see the wonderful "fire-carriages," of which they had then only heard rumours, but most cars were sufficiently unreliable to give reliability trials a chance of showing up their many weaknesses. I am well aware that even now there are those who advocate competitive runs over very long distances, or comprehensive trials lasting over a considerable period; but for all that I think I am right in saying that most men who have gone into the matter very carefully, or have had much experience in the organisation of such events, take a strong view in the opposite direction. To make such trials really useful, an extremely complicated and stringent set of rules would now-a-days be needed, while the nuisance that would be caused to other users of the roads would alone soon prove to be prohibitive. Then, too, some people would once more adopt some system of awarding marks for each and all of the features that are deemed to be most desirable in touring vehicles, such as was done in the Reliability Trials of 1902 and 1903, for instance, but they are apparently unaware of the heartburnings that inevitably result from any such arbitrary methods of determining the awards. It cannot. I think, be too widely recognised by all would-be trial-mongers that different owners of cars have very different ideas as to the relative importance of such matters as, say, silence, speed, and reliability, and that it is therefore hopeless, not to say misleading, to attempt to satisfy everybody by the adoption of any "mark" system. Everyone may agree as to what are the most desirable characteristics of a touring-car, but most people have very different notions about their relative importance.

Against short duration trials it is frequently urged that practically no estimation can be made, after so short a run, of the durability of the mechanism. If this were, however, the only respect in which long-distance trials are preferable, it seems to me that the advocates of such events are easily answered—unless they contemplate extending them over a totally impracticable period—because it will, no doubt, be very generally conceded that even a month of regular working would not produce any appreciable wear and tear on most of the best cars with which we are all acquainted. Apparently, the conclusion may, therefore, be arrived at that, whether an automobile competition lasts an hour, or whether it is drawn out to occupy a month, the relative durability of the various cars can only be taken into account by some less direct method than that of subsequent inspection. Personally, it seems to be very fortunate that any tendency for undue wear and tear to take place means that power is being wasted, even from the first, because it is, therefore, only necessary to place a big premium on efficiency of transmission, and we automatically give a great pull to the most durable car.

Even in the way of short duration trials, we certainly have a large number of possible kinds from which to make a selection. In the early days, when all cars were essentially "speed machines"—since none were anything like fast enough to satisfy ordinary users—there was no question as to what a motor car competition should consist of, for speed, pure and simple, was the one thing that everyone was thinking about. Now, however, things are quite different, most cars being able to attain sufficient speed to suit most people, and it is the hundred and one other merits of the best vehicles that are of real moment. How then are we to organise a competition which will automatically cause the best all-round car to be the winner?

Before attempting to answer that question, however, I want to bring into as prominent notice as possible an equally important matter which constitutes an even greater difficulty, and is, I sometimes think, apt to be entirely overlooked by many critics of the Tourist Trophy regulations. I refer to the classification of vehicles—a point which must essentially be considered at the same time, or even before, deciding on the precise nature of the actual contest. Now, what strikes me most forcibly in this connection is that the actual difference between two cars may quite conceivably have hardly any effect upon the cost of production, upon the average speed maintainable, or even upon the liability to break down when first turned out from the works in which it is built, but that nevertheless one of those cars may be cheap at a fairly high price, whereas the other may be dear, although sold for less money. Any form of competition is, therefore, bound to give very misleading results unless just these differences which constitute the true bases of comparison between such vehicles are placed at a very high premium by the rules, and unless the very greatest care is taken to equalise the chances of winning through superiority in any other respect. Conversely, however, it is obviously true that any competition which does bring out those real differences is just what motorists most require, for then an ordinary buyer who has no special knowledge on the subject is put in possession of the one kind of information which he otherwise finds it almost impossible to obtain. From this standpoint I deduce two salient conclusions. Firstly, that all cars which are allowed to compete against one another must be the same power, size, and weight; secondly, that the issues must not be confused by taking into account such things as prime cost, running cost, or, to more than a limited extent, silence and comfort, which are, after all said and done, matters that are well within the purview of all buyers, but have a different relative degree of importance to each individual.

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* A Paper read at the Automobile Club, January 18th, 1906, by A. G. New, Technical Editor of THE AUTOMOTOR JOURNAL.

Returning again to the main question now under consideration—the best type of contest—we may, I think, begin by dismissing any idea of handicapping the competitors, for it is quite difficult enough to ensure that all the cars are similar, without attempting to organise a system by which differences of power, size and weight could be accurately compensated for. I am well aware that this suggestion is open to the criticism that existing cars are of every power, of all sizes, and of very different weights, but I see no reason why they should in future continue to be so, and I am not alone in hoping to see the time when a limited number of clearly defined types will be built instead. One might even go so far as to say that the Tourist Trophy Race would alone justify its existence if it were to have this desirable effect, for, as I hope to show presently, there need be no such close adherence to any type of mechanism, form of body, or weight of chassis as would tie the hands of progressive manufacturers, but we should yet obtain the full benefits of some definite standardisation of type. Frankly, I do not believe that any automobile contest can be run usefully if no such exact classification is adopted as a hard and fast basis, and I am all the more sorry to have been compelled to form this opinion because it leads to some extremely unfortunate facts. It is, indeed, the seed from which one tree of discord has already sprung, this season's fruits being the fine crop of letters that have appeared from makers and users of steam cars.

As to the exact form that the contest should assume, this is, it seems to me, a relatively unimportant matter that might even be allowed to vary in accordance with the conveniences at the time. One and all practically amount to the same thing if the principles that I have laid before you were to be adopted, because the competition would, at any rate, then resolve itself into a trial of the following things:—(1) Uniformly good running for a reasonable period without breakdown of any kind; (2) capability of maintaining a good speed up all the hills on the route; (3) efficiency of transmission; (4) free running of all moving parts. These things may, moreover, be said, I think, to include most of those which constitute the real differences between one car and another, to which I have already referred. For the big event of the year, and, indeed, for any competition that could be so arranged, I do not hesitate to say that a simple race is, for many obvious reasons, far preferable to all other alternatives. So evident does this appear to be, that I do not propose to labour the point, but would merely remark, on passing, that a straightforward race, free from technicalities, appeals to the imagination of everyone, and that high speed running imposes the more severe test on every portion of a motor car.

Hoping that I have now cleared the ground for a closer consideration of the Tourist Trophy question proper, and that, incidentally, I have justified the somewhat heavy expenditure of your time in so doing, I now propose to pass on to the existing regulations, and to show that the spirit which pervades them is quite in accordance with the conclusions that have just been arrived at. Simultaneously, too, it will be my endeavour to meet certain objections which have been made in various quarters. Primarily, the regulations drawn up by this club aim (1) at limiting the engine power that is available by allowing a certain quantity of fuel per mile to each competitor, and (2) at specifying a certain useful load (weight and shape) that has to be carried by each chassis. In this manner the regulations, therefore (3) limit the average speed which is attainable, although (4) they also award the Trophy to the car that covers the entire course in the shortest time. One particular class of car is thus defined most clearly, and so long as all the cars use the same kind of fuel and convert it into power in the same manner, they start upon an absolutely equitable basis, and one which will enable the most efficient to arrive first at the winning-post. The principle adopted does more than this, however, for it lays down no absolutely rigid specification which would rule out cars capable of developing slightly more or slightly less power, neither does it arbitrarily demand any particular weight of chassis. The result is that there is ample margin for variations in these respects, although a more powerful engine must also be more efficient if it is to benefit by its additional size, and a heavier chassis must show the advantages of its greater weight by the manner in which it reduces friction. Otherwise, the more powerful engine may have to be run at much below its normal power if the car is to complete the course without running short of fuel, and the needless weight of the heavier chassis will also have the effect of handicapping the competitor. In either case, however, the car could reach the winning-post, unless the power or the weight were greatly in excess of what they should be, for it would only be necessary to drive it at a much slower speed than its more happy rivals, and the fuel consumption per mile would be reduced sufficiently.

This fact brings us right up to what I consider to be the best feature of the "fuel comsumption" basis as a means of limiting engine power. Briefly, it prevents the engines from being driven to death merely to enable a car to win the race, and it does so because an engine takes considerably more fuel when run at an abnormally high speed, but it only develops comparatively little more power. If, as some would have us believe, it were better to base our standard of power upon cylinder dimensions, there would not be this restraining influence upon the drivers, and this fact is, to my mind, quite enough in itself—although there are many other strong adverse reasons—to condemn "cylinder capacity" or "piston area" as substitutes for "fuel consumption." The main reason why the speed of the car affects the fuel consumption so greatly is because of the extraordinary effect produced by "windage," although I do not suppose that one motorist in a hundred fully realises the extent to which the power of his engine is employed in forcing the car through the air. But irrespective of car speed altogether, the fuel consumption of a petrol engine is enormously increased in relationship to the power developed as soon as a certain reasonable engine speed is exceeded. Both these points are of so much importance that I may perhaps be excused if I break off for a moment in the main thread of this paper to give a few figures concerning them.

I cannot do better, I think, than refer to the full load results of some tests which were made last autumn with a slow-speed engine and with a high-speed engine in order to show the fuel consumption per brake horse-power at various speeds; these appeared in THE AUTOMOTOR JOURNAL on October 14th.[*] When the former engine was run up to 1,200 revs. per min., the petrol consumption per horse-power was just double what it was at 800 revs. per min., while with the high-speed engine it was four times greater at 1,700 revs. per min. than it was at 1,000 revs. per min. At very low speeds the efficiency is not so high as it is at what may be called the "normal" speed, so that there is nothing to be gained in the Tourist Trophy Race by running an engine at an absurdly low speed, although there is—as is shown by these figures—everything to be lost by letting it "race."

As regards "windage," the table which will now be thrown on the screen gives, in a very striking form, a good idea of the retarding effect of the air on a car. This table was also prepared and published by THE AUTOMOTOR JOURNAL,[†] with a view to its being specially applicable to the Tourist Trophy, the figures being calculated from assumed data of an approximately correct character. It is, for instance, assumed that the car weighs 2,400 lbs., and that the effective cross-section is equivalent to 12 square feet (flat). Time prevents me from saying very much by way of explanation of the whole table, and I must therefore restrict myself to merely extracting a few figures. In the fifth column it will be observed that if there were no such thing as windage, the car in question could, with only 12-h.p. available on the road wheels, attain a speed of 224 miles per hour on a down grade of 1 in 60, whereas column 8 shows that in reality the power needed would be 548-h.p.; in reality, too, the speed attainable, in practice, with 12-h.p. is only 39½ miles an hour (*see* column 9). The manner in which the amount of power absorbed by windage goes up as the car gathers speed, is brought out very forcibly by comparing columns 9 and 13 together, no less than 234-h.p. being needed for windage alone at 114 miles an hour, while at 71 miles an hour it is 57-h.p., at 50 miles an hour it is 20-h.p., at 32 miles per hour it is 5·2-h.p., and at 21½ miles per hour it is only 1½-h.p. Even if such a car were to fall, end on, over a precipice, it would only attain a speed of 200 miles an hour, for the windage would at that speed exactly counterbalance its entire weight.

Briefly pointing the morals that engines should be kept running at a reasonable speed, but certainly ought not to be "raced" while running in the Tourist Trophy Race, and that any indulgence in very high speed driving of the cars is wasteful from the point of view of "windage," I can now resume the main line of my subject.

The further merits, and also the demerits, of the "fuel consumption" basis (for limiting power), demand attention next, particularly as there is one most serious drawback that can only be removed by giving it the very widest publicity that it is possible. Advantageous, I think, are the facts that the primary principle on which the Tourist Trophy is based leaves designers quite free to make even the most radical improvements in engine construction, and that it takes into account the efficiency of everything, from the fuel tank to the tyres on the road wheels. Disadvantageous to some extent are the facts that too much importance is, perhaps, attached to the economy of the carburettor, and that there is a decided advantage to be gained by adopting undesirable methods of control, but these are, it seems to me, comparatively minor evils, since they only affect easily replaceable small parts, and are palpably adopted temporarily for a well-understood purpose. The one great drawback is, however, that the public are apt to regard the Tourist Trophy as a fuel-consumption contest pure and simple, and to run away with the idea that the main object of the Automobile Club has been to reduce the cost of petrol. Unfortunately, there is just sufficient in this notion to make it gain credence; but, on the other hand, no private owner need bother himself enough about his petrol bill to make him take much interest in any such competition. The difficulty, then, is to bring home to the public the real significance of the contest, and, in the first place, to make all motorists understand that reliability, durability, flexibility, and good all-round capabilities are the things aimed at. Once it is understood that the race is quite as much a *tyre*-consumption contest as it is a fuel-consumption trial we shall have overcome that which is most likely to endanger the success of the Tourist Trophy type of competition.

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[*] See pp. 1268 to 1270 for the results of these tests, and p. 1116 (Sept. 9th) for the tabulated figures obtained from road trials with various cars.

[†] See p. 1305, October 21st last.

No attempt can be made to deal in any detail with the many other important provisions which were included last year, and have still been retained in the regulations, for it would take too long to do so. It is, I think, sufficient to say that there are many excellent clauses for compelling the competing cars to be ordinary *bonâ fide* touring vehicles. What is of great interest, however, is to note the wide differences in size between the engines on the various competing vehicles, and also to observe the average speed and the fuel-consumption figures that are available from last year's race. For the purposes I cannot do better than bring before your notice two more tables that were prepared and published by the journal with which I am connected. The first[*] of these gives the leading particulars and chief dimensions of the cars which were entered. Referring to the tenth and eleventh columns, we find that the cylinder capacity of the engines varies from 49 cubic inches per revolution (44,000 cubic inches per minute) to 122 cubic inches (122,000 cubic inches per minute), while the normal speed of the cars on the top gear differs as much as from 23¾ miles per hour to 45½ miles per hour. The other table[†] gives the results of the race, the ninth column from the left showing the average speed maintained, and the sixth column from the right indicates the fuel-consumption in miles per gallon. Of the eighteen cars that finished, the slowest did 27·2 miles per gallon at a speed of 23 miles per hour, while the highest consumption was 22·5 miles per gallon, and the speed of the winner was 33·9 miles an hour. That such enormous variations should be found is doubtless only natural, considering the novel character of the competition, but I venture to think that this fact alone is an ample proof of the great utility that the Tourist Trophy has been already. Many manufacturers have freely admitted to me that they obtained more valuable information through the work carried out by them in connection with this race than they had from any previous contest. I think it is quite safe to conclude that the competing cars this year will much more closely resemble one another both in power and speed capabilities, and that a very marked all-round improvement will be found in the average car of the particular type that is specified by the existing regulations.

And now I come to the vital question as to whether this type of contest has, in the light of last year's race, proved a success or a failure. From the actual results it is, of course, obvious that quite a number of cars did unexpectedly good performances, no less than fifteen making an average speed of over 25 miles an hour over the entire distance. The route was by no means an easy one, although the weather conditions were extremely favourable. Numerous corners, many of them extremely sharp, rendered frequent pulling up necessary, and the narrowness of the road in a number of places made passing anything but easy. The rough contour[‡] which is given by one of the lantern slides lent by THE AUTOMOTOR JOURNAL, shows that the gradients are quite sufficiently steep to impose ordinary touring conditions, while the tables that accompany it bring to light the fact that the up grades are steeper (being only 18 miles long) than the down grades (23 miles in length), and that only about one-fifth of the circuit (11 miles) is practically level.

But the real point is whether the winning car, and those which ran it close, are thoroughly useful touring vehicles, or whether the race has merely enabled some specially-built speed machines to come out triumphant. Some would have us believe that the whole system on which the contest is based must be far from satisfactory, since the Trophy was won by an unconventional type of engine. Many of these good people, however, would say the same thing if a 1908 car could have suddenly put in an appearance and have swept everthing before it, for, unfortunately, fashion—and often sheer prejudice—has become quite the ruling spirit with the motoring public of to-day. There is nothing like practical trial in such matters, however, and therefore I determined to satisfy myself on the subject if possible, and to ascertain by personal experience whether there were anything of the "freak" about the winning Arrol-Johnston, or about the Rolls-Royce car, of which one came in second. To cut a long story short, I have been absolutely delighted with the capabilities and controllability of both types of vehicle, and am quite convinced that for good all-round touring work they represent the best that has been done in the construction of that very useful size of automobile. I have now driven the winning car a total distance of about a thousand miles, in all sorts of weather, in the London traffic as well as in the open country, and have similarly driven the higher-geared Rolls-Royce a distance of some 250 miles. In neither case was the car in any way under the supervision of the makers, and I need hardly say that I had no mechanician. Crawling through the traffic, or starting from rest on a direct-drive gear which is yet sufficiently high to break the law to the tune of over 150 per cent.—if one did not happen to be a law-abiding citizen—is a simple matter with both these vehicles, and even a member of the Guildford Bench would appreciate being able to maintain 19·9 miles an hour up very steep hills. Personally, it seems to me that if the Tourist Trophy is responsible for the production of such "freaks" as these, the more we have of it the better it will be for all motorists. It will, in my humble opinion, have done a good deal even if it only breaks down the reactionary feeling that exists against unconventional types of car, merely because they do not happen to be fashionable.

To my mind, the only pity is that we cannot extend the useful field of the system by instituting similar events both for smaller and for larger cars. The difficulty is, of course, purely one of organisation, and is chiefly due to the lack of a clear course for a longer period than can be arranged in the Isle of Man. Just in the same way that we now hold the race for chassis of such power as to run 25 miles on the gallon, taking a useful load of 1,125 lbs., so we could have one for lower-powered chassis carrying lighter loads on a consumption of 35 miles per gallon, and another for highly-powered ones taking greater loads on an increased fuel allowance.

Although fully realising that I have already trespassed on your good nature by the length of this paper, a word or two should, I feel, be said in conclusion concerning the probable effects of the alterations made in the rules for this year. Generally speaking, it does not seem likely that they will materially affect the results, and I think that they may be regarded chiefly as a means of preventing certain weak points in the previous rules from being taken advantage of by any competitor. Thus, for instance, the number of "speeds" in the gear-box is limited to four, and at the same time the maximum and minimum gear-ratios are restricted in an indirect manner. A multiplicity of "speeds" might unquestionably prove beneficial to a competitor, since his engine could be kept running at a more efficient mean speed throughout the race, and, for the same reason, it would pay him to make the first speed as high as the steepest portion of the actual circuit would permit. Now, however, his first speed must be low enough to climb a hill of 1 in 6, and his top gear—which might otherwise have been excessively high for travelling downhill—must be low enough to be used at 12 miles an hour on a level road; the available range of gearing is consequently such as to be suitable for ordinary touring. (As a matter of fact both the Arrol-Johnston and the Rolls-Royce vehicles of last year can easily conform with these new requirements.) Some of the modified rules tend, however, to reduce the average speeds at which the course can be covered, but how far further improvements of a general nature, coupled with the greater attention that has now been concentrated on carburettor design, on petrol gauges for the fuel tank and on shape of body (to reduce windage) will compensate for the, reduced fuel allowance, and for the increased weight that has to be carried, remains to be seen. The race this year is, at any rate, sure to be quite as interesting and exciting, if not considerably more so, than it was last year. Certainly the club are to be most heartily congratulated on the success of their "all-British" and entirely novel type of contest for touring cars.

Mr. W. Worby Beaumont occupied the chair, and, after moving a vote of thanks to the lecturer, called upon Mr. Lyon Sampson to open the discussion. Mr. Fred C. Coleman then followed, and in an extremely able speech urged the Club to maintain a sporting attitude in the organisation of all its automobile events. Other speakers included Messrs. J. S. Napier (the winner of last year's race), Claude Johnson, Percy Northey, and R. Royce (the driver and builder, respectively, of the car which secured second place).

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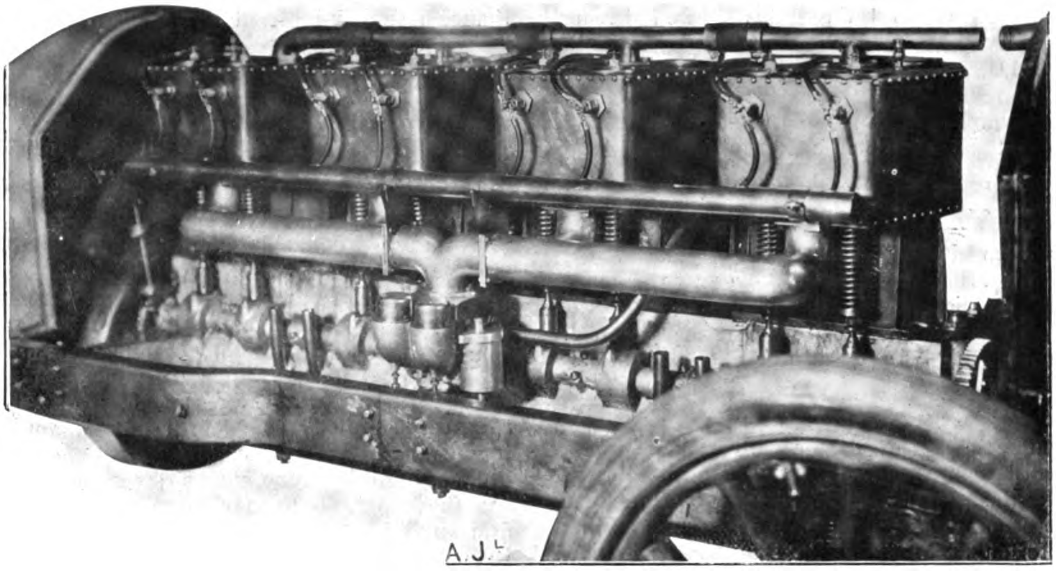
[*] p. 1110 of our issue of Sept. 9th last.

[†] p. 1166 of our issue of Sept. 23rd last.

[‡] p. 1117 of our issue of Sept. 9th last.

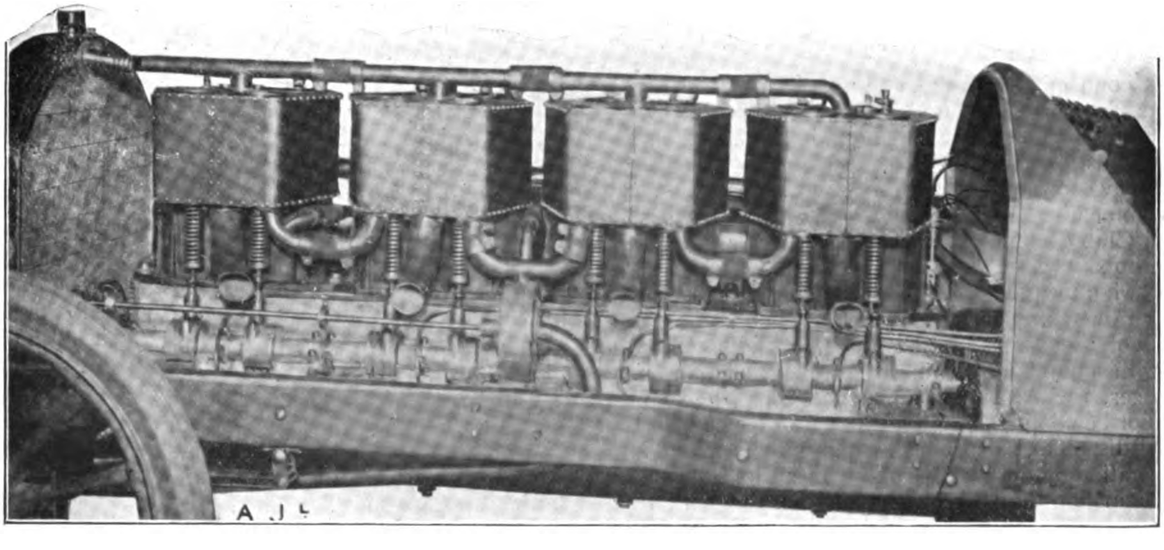
RACES, RECORDS, AND TRIALS.



The 8-cylinder "250-h.p." Vanderbilt Racer which was entered to take part this week in the Florida race meeting at Ormond-Daytona Beach. View of the engine from the "off" side, showing the special carburettor and the branched induction-pipe. Each pair of cylinders has the water-jacket formed by sheet-copper, the inlet-valves are all arranged on the right-hand side with ignition-plugs above them, and there are auxiliary ignition-plugs (connected up in parallel with the other plugs) passing through the sides of the inlet-valve-chambers. As we have previously mentioned, M. Francois Richard is responsible for the design of this powerful monster, which is, we learn, geared to a speed of 152 miles an hour.

Ormond-Daytona Races.

Up to the time of going to press, little news had come through from Florida of the doings at this annual race meeting on Daytona Beach, which started on Monday last. In preliminary essays, a Stanley steam "freak" is credited with having covered a mile under the half minute, and Clifford Earp is reported to have touched 31 secs. for the distance. For full official times in the programme, however, we have to wait—mainly first heats and minor events were down for the first two days' racing—but, before the start, trouble had already been reported with the wonderful Vanderbilt monster. Amongst the early races was the Dewar Cup (1 mile). The Stanley car secured this in 33 secs., although in a heat the same car was timed for 32½ secs., a new record, and later in the day further reduced this record time to 31⅗ secs.



View, from the "near" side, of the 250-h.p. engine on Mr. A. G. Vanderbilt's Racer, showing the arrangement of the exhaust-valves, of the short exhaust-pipes for each pair of cylinders, and of the circulating pump, with its water-pipe connections to and from the cylinder-jackets and the carburettor-jacket. This engine appears to have been built in Mr. Vanderbilt's private garage in New York.

Lancia, on his Fiat, was first in the heavy-weight cars, making for the mile 37 secs. One disappointment we learn is, that no White steamers are entered—as the makers were not able to arrange for their racers to go over to Ormond. Webb Jay and his spirited driving will be missed.

One of the Darracq racers was announced to be over weight, and, therefore, Hemery, in spite of the extraordinary exertions which he had made to get the cars there in time, is reported to have scratched the entire Darracq team.

Milan Tourist Trial.

It has been decided that this trial, under the auspices of the Milan A.C., will be over 4,500 kiloms. through Italy, starting from Milan, in 11 stages. An average speed of 30 kiloms. per hour must be maintained, the maximum allowed being 40—the Italian legal limit.

Grand Prix of the A.C. de France.

As, no doubt, the course will be early visited by prospective English competitors and many British tourists, who may take this picturesque country *en route* to some more southern point, it may be of interest to note that the chief hotels at Le Mans are de Dauphin, de France, du Simon, de Paris.

An early result of the selection of the course is the foundation of the Sarthe Automobile Club, with M. Singher, one of the prime movers in advocating the choice of this circuit, as first president.

Circuit Européen.

Following the International conference of clubs interested in this event, which was held in Berlin on Saturday, similar meetings will be held subsequently at centres of other leading Continental countries, in order that the success of the trial may be assured throughout every country which will be traversed. It has been decided that the trial shall take place in August, and that "observers" on each car shall be changed upon reaching each fresh country, in order that there may be no language difficulties amongst the competitors.

French Voiturette Contest.

In connection with the Voiturette Trial, which took place in November last under the auspices of *L'Auto*, the performances of the competitors in which were published by us in our issue of December 2nd, the A.C. de France have now announced an important decision. It will be remembered that soon after the conclusion the French Club declined to officially record the times of the competitors owing to certain difficulties which had arisen owing to the strewing of nails on the road, and although it was suggested by the organisers that the portion of the contest which was so maliciously interfered with should be eliminated from consideration by the judges, the A.C. de France held that this course could not be adopted, and that the performance over the original distances, as specified, could only be taken into consideration by the jury. In the meantime, owing to the anticipation that the suggestion, that the portion of the contest affected by the nail-strewn road should be eliminated, would be accepted, *L'Auto* had allowed it to go forth that certain cars were thereby the winners, which, under the final decision of the A.C. de France, proved not to be the case. The competitors in question not unnaturally, therefore, published advertisements announcing themselves as the winners of the competition, statements which subsequently, of course, had to be modified. Under these circumstances the A.C. de France have now inflicted penalties upon the offending firms for having given publicity to unauthorised and incorrect results. These take the following form:—Messrs. Lacoste and Battman, 1,000 francs fine and six months' suspension from competitions; the Vulpes firm and Messrs. De Dion-Bouton, 100 francs fine each.

Hydra Cup for Voiturettes.

After announcing details in regard to the rules to govern this competition, as is generally the custom on the Continent, a number of modifications are published in another set of "final" rules. It is now announced that the competition for the Hydra Cup is open to 4-wheeled voiturettes or small cars of a maximum catalogue price of 3,900 francs, complete with carriage body and ready for the road. The weight, with carriage body complete, is now announced to be a *minimum* of 350 kilogs., *instead of a maximum.* The distance is to be 1,000 kiloms. spread over three days, and the contest is to take place annually, the winning firm to hold the Cup and its privileges for one year. In 1906 the date chosen is June 8, 9, and 10. In addition to the Cup, the winner will receive 5 francs per day (in the event of the car being fitted with a Hydra ignition system, 10 francs per day) so long as the holders of the Cup are not beaten. The entrance fee is 100 francs per vehicle, of which 50 francs will be returned to starters. A maximum of three vehicles to each manufacturer is allowed, and the whole contest will be officially timed. During the two nights' rest cars will be strictly "parked," and no repairs or adjustments will be allowed, except in running time. The actual course has not yet been fixed. A special Cup for the best performance of any "team" of cars is also offered.

Bombay-Mahableshwar Reliability Trial.

A cablegram from India states that three cars have tied, for the best performances in this trial over 500 miles, for the Mysore Cup. These are a De Dietrich, a Richard-Brasier, and a Fiat. Under arrangement, it is also stated that each of the entrants will be the custodians of the Cup for three months. We await details of this event by mail.

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Through India by Car.

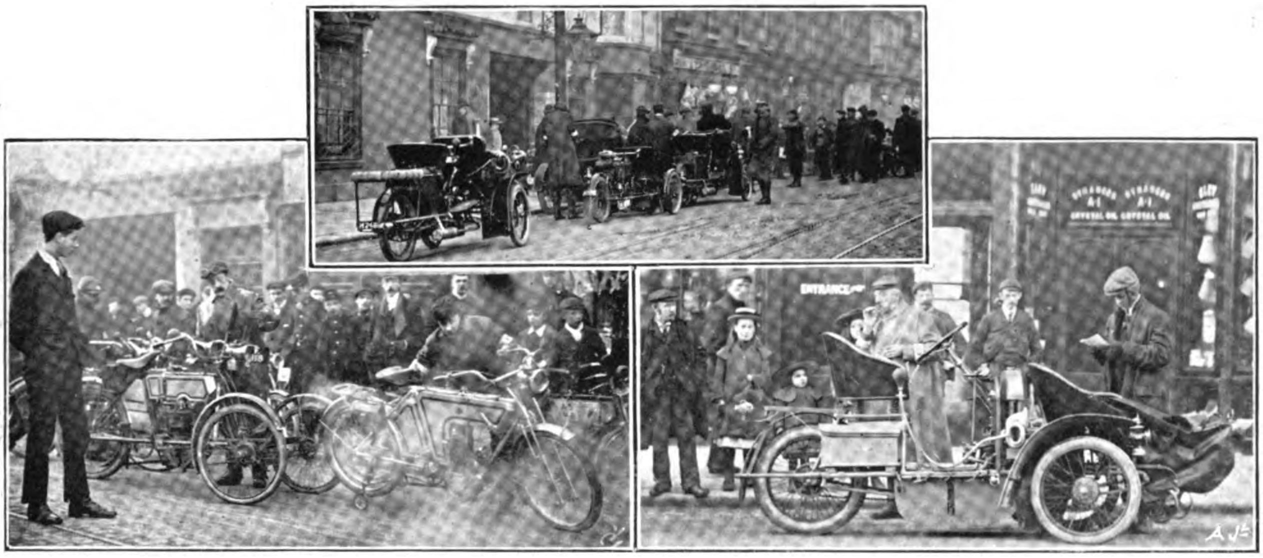
Mr. C. J. Glidden, to whose start on his tour through India and the Far East in the trusty Napier, which has already carried him nearly 30,000 miles, we referred to shortly before Christmas, has just cabled that he has added another 4,405 miles to his record. After landing at Bombay and driving northwards to the Khyber Pass, he drove right across Northern India by the Grand Trunk Road to Calcutta. As previously mentioned by us, Mr. Glidden intends extending his tour through Burma, Ceylon, Siam and Japan.

An Author's Name Omitted.

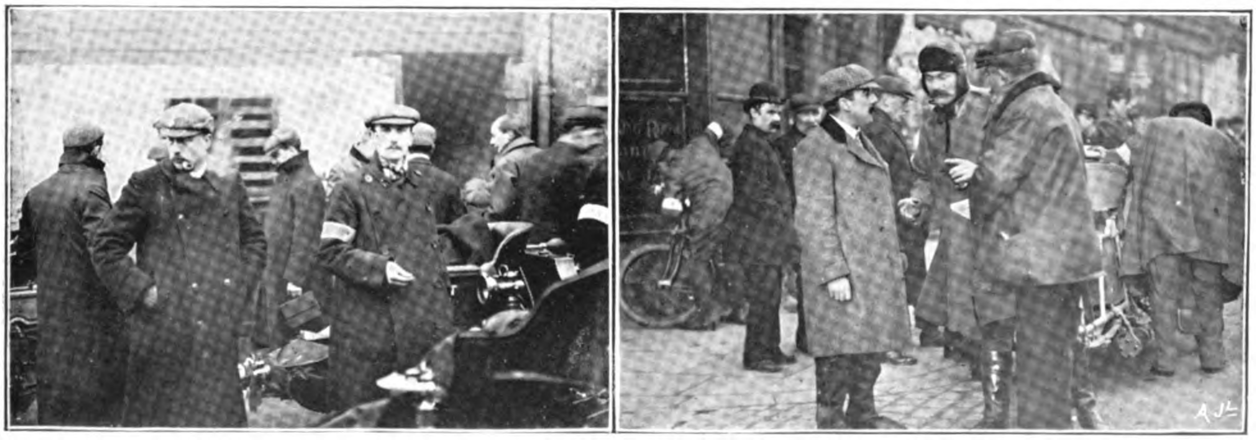
In our American contemporary *The Motor*, a serial article appears on "The Magneto," by Alex. Schwalbach. This is one of the many cases in America—and we are sorry to say in Germany also—in which, judging by the annexation of original matter and drawings, the name of The Automotor Journal should be included as either "part" or "sole" author.

MOTOR CYCLING.

AUTO-CYCLE CLUB 100 MILES TRIAL.—Inside the Chequers Inn, Uxbridge. Final preparations before the start.



AUTO-CYCLE CLUB 100 MILES TRIAL.—Outside the Chequers Inn. The competitors waiting to be sent off. Final adjustments and preparations.



AUTO-CYCLE CLUB 100 MILES TRIAL.—Before the start. Left picture: H. Fear, who entered a 4½-h.p. Stevens-Ashford tricar, and W. Pratt, who drove the machine in the trial. Right photograph: Messrs. Ashford and Smith. A knotty point.

Quarterly Trials (Auto Cycle Club).

SATURDAY last was the occasion of the first Quarterly Trial held by the Auto Cycle Club. These trials are open to any form of motor cycle, and on this occasion the entry list numbered twenty-one. Of these eleven were bicycles, the remainder being passenger machines. A start was made at the Chequers Hotel, at Uxbridge, at 9 a.m., there being only one absentee. From Uxbridge the route was to Banbury, where competitors were allowed to take in petrol and water—lubricating oil was on no account to be replenished throughout the journey—and from Banbury the machines had to be driven back again to Uxbridge, thus covering a distance of 125 miles. During the run, times were taken up Dashwood Hill, but these are not published on account of the Club rules. The following is a *resumé* of the results :—

No.	Entrant.	Machine.	Dash-wood Hill.	Remarks (see foot-notes).
		Bicycles.		
1	G. Hulbert	3-h.p. Triumph ...	—	D
2	H. G. Cove	3½-h.p.. F.N. (4-cyl.)	—	T
3	Quadrant Cycle Co.	3½-h.p. Quadrant ...	2nd	NS
4	,, ,,	,, ,,	—	D, I
5	W. Hayes	3⅜-h.p. Rex ...	—	D
6	Magneto M.M.C. ...	4-h.p. C.I.E. ...	4th	T, NS
7	,, ,,	,, ,,	—	D
8	G.B. Motor Co. ...	5½-h.p. G.B. ...	1st	NS
9	G. H. Wait	3¼-h.p. Clyde ...	Did not start.	
10	Werner Motors ...	4-h.p. Werner ...	3rd	NS
11	W. Hayes	3⅜-h.p. Rex ...	—	D
		Tri-Cars.		
12	Singer and Co. ...	6-h.p. Swift ...	6th	S, P
13	W. B. Barnes ...	6-h.p. Invicta ...	7th	V
14	Magneto M.M.C. ...	6-h.p. Barnes ...	—	C
15	Riley Cycle Co. ...	9-h.p. Riley ...	1st	R
16	M. Stewart	10-h.p. Lagonda ..	2nd	E^1
17	Werner Motors ...	5-h.p. Werner ...	—	B
18	Lagonda Motor Co.	10-h.p. Lagonda ...	3rd	T, I
19	E. E. L. Baker ...	10-h.p. Lagonda ...	4th	T, NS
20	H. Fear	4½-h.p. Ashford ...	—	C, Ch
21	G. W. Manning ..	10-h.p. Lagonda ...	5th	E^2

NOTE.—B = Belt trouble. C = Carburettor trouble. Ch = Chain broke. D = Stopped on Dashwood Hill. E^1 = Engine gudgeon-pin broke. E^2 = Engine piston seized. I = Ignition trouble. P = Short of petrol. R = Broke radiator in collision. S = Removed non-skid. T = Tyre trouble. V = Valve trouble. NS = Non-stop run.

Those competitors who are noted as having made non-stop runs will receive certificates, subject to the report being confirmed by the judges. Tyre troubles were not, except in the case of No. 2, allowed to interfere with otherwise non-stop runs.

Auto-Cycle Club—Annual Meeting.

THE date fixed for this meeting is March 14th, at 7 p.m.

The Annual Dinner.

THE third annual dinner of the Auto-Cycle Club, held on Wednesday of last week at the Criterion, must be voted the most successful of any social function hitherto held by the Club. A very large number of members and guests were present to support Mr. Robert Todd, in the chair, amongst these being Earl Russell, Col. H. C. L. Holden, Sir Martin Conway, Messrs. E. A. Lamb, Julian Orde, A. J. Wilson, R. Johnson, Lyons Sampson, H. W. Staner, E. R. Shipton, Stanley Spooner, C. A. Smith, J. C. Percy, W. Rees Jeffreys, G. F. Sharp, Wilbur Gunn, Walter Groves, F. W. Fowler, Dixon F. Straight (secretary), &c.

A very enjoyable function during the evening was the presentation of the medals and prizes to the successful competitors in connection with Club events during 1905, the list including the three Challenge Cups which were disputed at the Crystal Palace Annual Race Meeting in September. Much enthusiasm reigned amongst the guests, an excellent spirit of camaraderie being a feature of the evening's entertainment.

Following the loyal toasts, in proposing the toast of the evening, "The Auto-Cycle Club," Earl Russell said that no one in the motor cycle world could afford to remain outside the fold of the club. He pointed out that it was a matter for much satisfaction that the British team in the International Cup Race last year was the only one which finished the race. During his remarks he urged very strongly upon members to use every opportunity of suppressing the misuse of the motor horn by the "push bicyclist."

Colonel Holden, who responded to the toast, drew attention to the excellent programme for 1906 which had already been arranged, including the Club's open hill climb, penalty run, Land's End to John o' Groat's trial, the International Cup Race, a six days' trial, a consumption trial, the passenger motor trials, and the annual race meeting. The latter, Colonel Holden pointed out, was the only meeting in the United Kingdom at which only mechanically-driven machines were allowed to compete. As indicating the feeling of respect and the popularity which the British team earned on the Continent at the International Cup Race last year, Colonel Holden read a communication which had been received from the Marquis of St. Mars, to whom the Club have presented a gold medal in recognition of the services he rendered the British contingent at the International Race, at Dourdan, in June last. The Marquis's letter was as follows :—

"I wish first to express my great regret that I am unable to be present to-night at the anniversary dinner, to which you have so kindly asked me. It would have been a great pleasure to thank you all personally for the beautiful memento you have given me of my very pleasant trip in France with the English competitors, and though I feel it almost undeserved I shall always prize the medal as a token of the goodwill and friendship of the members of the Club.

"It seems incomprehensible to me that an industrial and commercial nation like England should handicap an industry which already

AUTO-CYCLE CLUB 100 MILES TRIAL.—Some of the entrants at Uxbridge. In the picture on the left are Messrs. W. Gunn, E. L. Baker, G. W. Manning, H. Fear and Fry; in our other photograph, Messrs. G. Hulbert and O. C. Godfrey are prominent figures.

employs so many of the working class, and has unlimited capacity for the employment of so many more. It is unnecessary for me to dwell upon the difficulties which English competitors experience against their foreign antagonists—they are too obvious and too well known—but let me say we have seen the success of a well-built British car in Continental races, and I need not emphasise the fact of the influence it has had on the public mind, nor the very substantial pecuniary result it has brought the Company. Therefore, with such a brilliant example before us, with so much to gain, it seems superfluous to beg the motor cycle industry to do their best to help the Club in the forthcoming races.

"The same success that has attended the British car *must* attend the British-built motor cycle. Though great difficulties may be in the way they must be overcome.

"Pray remember that whatever criticisms have been passed on the English team in the recent International Race, it was the only one running complete at the finish. Let me add that the sporting way the Englishmen conducted themselves, combined with their strict observation of all rules, won for them my sincere admiration, and not only mine, but the admiration of all the clubs present."

Colonel Holden then referred in complimentary terms to the work done by Mr. O'Gorman in smoothing over several difficulties which had existed with the French Club, and he concluded by endorsing the advice of Earl Russell in regard to the stopping of the abuse by cyclists of the motor horn.

Mr. Wilbur Gunn, who responded on behalf of the affiliated clubs, said he looked to the A.C.C. to watch the united interests of auto-cyclists in the forthcoming re-consideration of the motoring laws. He hoped the whole body of motor cyclists would work in harmony to one end, viz., the general good. Through the Auto-Cycle Club, he thought the whole of the riders were brought together in one catholic body, which upon emergency was able to present a strong front to any enemy of the sport and pastime. On behalf of the trade he congratulated the Club upon the splendid way in which they had carried out all trials, and the fairness and diplomacy with which all doubtful points and disputes had been dealt with by them.

Mr. H. W. Staner, in whose hands was the toast of "The Pastime and Sport of Auto-Cycling," thought that in the face of oft-repeated assertions that motor cycling was dead, the gathering of the Club that evening demonstrated that the sport was in a very healthy condition. He looked in the future for a three or four-cylinder motor cycle on a spring frame to establish the pastime upon a firm basis. In racing against foreign manufacturers, Britishers, he thought, should fight them with their own weapons, irrespective of what, as sportsmen, we might think. Nothing but horse-power could secure big international races, and he would rather advocate one efficient representative machine for Great Britain than several inefficient machines. Finances to this end were necessary, and he urged both makers and sportsmen to come forward with generous funds to support the British position in the International motor cycle world. It was essential for the industry that we should win one of the big Continental races, and thereby secure for home manufacturers the support of the British buyer.

Sir Martin Conway responded to the toast, and after the "Visitors" had received due recognition, very great cordiality marked the usually formal toast accorded to the chairman.

CLUBS AND ASSOCIATIONS.

A.C.G.B.I. Examinations for Driving and Mechanical Proficiency Certificates.

AN examination for the above was held last week. The number of entries was by far the largest on record, and it is hoped to announce the results within the next few days.

The next examination for London is to be held on February 21st at 119, Piccadilly, W., and will be continued on the following days if found necessary.

A large number of candidates are expected to attend the provincial examinations, which take place during this month and next, particulars of which are below:—

January 30th, Liverpool (Exchange Hotel); 31st, Blackburn, (White Bull Hotel); February 1st, Leeds (Gt. Northern Hotel); 2nd, Newcastle (County Hotel); 3rd, Darlington (N.E. Hotel).

Scotland.—February 5th, Glasgow; 6th, Edinburgh; 7th, Dundee; 8th, Aberdeen.

Hertfordshire County A.C.

THIS club has had a large accession to its membership through the decision of the West Herts Motor Club to wind up and join the County Club, in order to make one strong automobile body for the county. At a committee meeting of the County Club, held on January 18th, the following members of the late West Herts Club were elected to membership:—Messrs. J. T. Gardner, T. Williams, J. H. Evans, G. H. Gray, J. S. Harwood, A. J. Salmon, Matthew Arnold, E. H. Arnold, H. S. Adey, Basil Crump, M. A. Colebrooke, R. S. Cooper, D. Doyle, J. H. Evans, R. Ellis, W. S. Edmunds, Dr. Ellerton, Messrs. P. Fisher, R. M. Finlay, P. Gowlett, J. Harwood, A. B. Horton, Drs. J. S. Hudson and A. L. Reid, Mr. G. H. Hedge, Rev. A. J. McKinney, Mrs. Monro, Mr. Chas. McWhirter, Mrs. McWhirter, Messrs. W. S. Wilson and R. Wheelwright.

Wolverhampton A.C.

MEMBERS of the Club foregathered at the Star and Garter Hotel, Wolverhampton, on Friday of last week, for the occasion of the fourth annual dinner. A goodly company of automobilists with their guests assembled under the chairmanship of Mr. Edward Lisle, the president, including Captain Burnett (Chief Constable), Messrs. T. Cureton, T. T. Mills, F. Bishop, A. Scott, J. O. Evans, W. H. Evans, G. W. Evans, J. W. Davis, P. Percival, W. Rees Jeffreys, J. Lisle, T. Lisle, T. G. Gatis, I. H. Baxter, Beddows, W. H. Edwards, Boswell, Tomlins, E. A. B. Woodward, Dr. Pratt, Dr. Grout, and Mr. S. R. Rhodes (secretary).

A great compliment was paid the members of the Club by the toast of "Success to Automobilism" being submitted by Captain Burnett, the Chief Constable. Mr. Rees Jeffreys, in responding, drew attention to this fact, saying it was a satisfactory omen that in Wolverhampton a chief constable proposed the toast Captain Burnett had done; in many towns it would be impossible to induce a chief constable to perform such a service. One of the things automobilists had to do was to suppress the reckless and inconsiderate motorist. He was not to be stopped by police traps, but by clubs, such as Wolverhampton, working in harmony and co-operation with the police authorities.

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LEGAL PUZZLES.

An Acrobatic Case.

IN another case, which came before Mr. Justice Bigham and a special jury last week, Mr. Lloyd, the owner of a private motor car, which had a collision with a van belonging to Messrs. Bean & Co., sued the latter for damages to his car. The smash appeared to have been a very bad one, and created so much excitement that a whole crowd emerged from the "Stag and Hounds" on the Staines Road, where the accident occurred. On this statement being made, one of the counsel engaged sarcastically inquired whether the policeman and customary children, who are kept in attendance for such occasions, also emerged. A photographer gave evidence that he was so much frightened by the collision that he fell off his bicycle on seeing the motor car turned over and the four occupants fired into the air. Finally the jury stopped the case, and gave a verdict for the defendants on claim and counter-claim, the result being that the proprietors of the van were awarded £10 5*s.* 6*d.* compensation.

Heavy Damages.

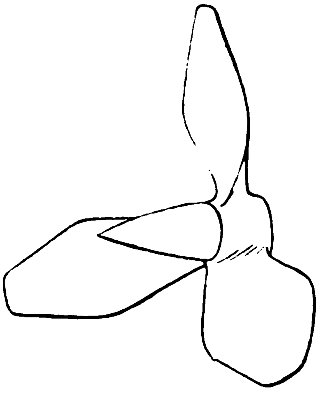
A CASE was heard at the Court of King's Bench on Thursday of last week, in which Mrs. Norton claimed damages for the death of her husband, Mr. W. H. Norton, a civil servant in the receipt of £400 a year, who was killed by being run over while cycling at Anerley, by the motor car of Mr. F. W. Baily, of the Crystal Palace. After a protracted hearing, in which the evidence tendered was of a somewhat conflicting character, and in spite of what appeared to be very clear evidence that the manner in which the cyclist rode contributed to the accident, the jury found a verdict for the plaintiff, and assessed damages to be accorded to her at the large sum of £1,500. At the Coroner's inquest upon Mr. Norton, it will be remembered, Mr. Baily was entirely exonerated.

MOTOR BOATING.

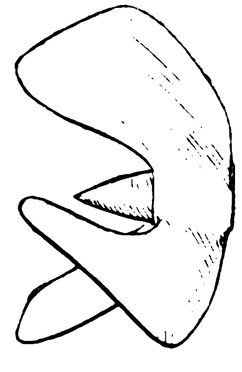
A 25-ft. Yacht Motor Tender, constructed by Messrs. Brooke and Co. for the Hon. Walter Guinness' Yacht. She is fitted with an 18-h.p. 4-cylinder Brooke motor, and gives a speed of ten miles an hour.

Propellers.

ON Thursday evening, the 18th inst., Mr. D. Ramsay Smith read a paper on the subject of propellers before the British Motor Boat Club. The author gave an account of the historical development of the propeller, and dealt in general terms with the theory of boat propulsion. Three-bladed propellers are, said Mr. Smith, used more often than others because they have been shown to be capable of transmitting the greatest amount of power under the most exacting conditions. Tramp steamers and other boats continually calling at jetties are generally fitted with four-bladed screws, however, because if one gets knocked off, the propeller is not thrown so much out of balance as it would otherwise be. Mr. Ramsay Smith illustrated his lecture by chalk drawings, and we reproduce two sketches of propellers made by his firm.



High-speed Propeller.—Constructed for the Putney Motor Company, Limited, to transmit 30-b.h.p. at 960 revs.



Towing Propeller for Thames Tug. Weight 17 cwt. Designed and fitted by D. Ramsay Smith and Co.

"Perle de la Mediterranee."

THE Cavaliere Vincenzo Florio, who has given such encouragement to automobilism in Italy, by creating the Florio Trophy last year, and who has for this year organised the Targo Florio for motor cars in Sicily, has sent us particulars of another important competition, this time for motor boats, entitled the "Perle de la Méditerranée," for which he is engaged in elaborating the arrangements, and has also offered a trophy. The scene of this event, which will comprise probably the longest distance for which motor boats have ever yet competed, viz., 842·660 kil., will also be Sicily, and will include the complete circumnavigation of that island, and will be carried out in six different stages. The race will start from Palermo, the first stage ending at Messina (222·24 kil.). From Messina, the second day's run will be to Catania (92·6 kil.), the next stage to Syracuse (55·6 kil.), the following stages being from Syracuse to Girgenti (222·24 kil.), Trapani (148·16 kil.), and back to Palermo (101·86 kil.). The Cavaliere points out that the course is an ideal one for motor boats, as it traverses three different seas, the Tierrenian, Ionian, and Mediterranean Seas, in which different kinds of weather and currents may be expected, while in addition to the harbours at which the different stages end, the indented character of the coast provides admirable protection in case sudden storms should arise.

There are two classes in the competition, viz.: (1) racers, (2) cruisers, each subdivided into three categories, viz.:—

	RACERS.	CRUISERS.
Cat. 1	Up to 8 metres.	Under 8 metres.
,, 2	,, 12 ,,	,, 12 ,,
,, 3	,, 18 ,,	,, 18 ,,

The trophy to be awarded to the winner, entitled the "Perle de la Méditerranée," consists of a large pearl mounted on a gold plate, and valued at about 8,000 francs, in addition to which some 50,000 francs will be distributed in various other prizes.

* * * *

A Real Guide to the Press.

WE have received the thirty-third annual issue of Willing's Press Guide, which presents all the admirable features of previous issues, and has been brought thoroughly up to date. The present "Willing's" is like the others, and in saying that we cannot praise its thoroughness and reliability more.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THE FLYING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—If Mr. J. D. Roots would kindly give us an illustration of his flying machine, it will, I am sure, be of much interest to some of your readers. Unlike Mr. Roots, I pin my faith to the aeroplane, and am unable at present to see how flight can be a practical success without its use, for it is on this principle that birds fly, and the finest example is the albatross. Even those birds who flap their wings rapidly are in reality taking a quick succession of aeroplane glides. If birds were clever enough, and provided they had sufficiently light and powerful motors, they could save themselves a good deal of exertion by keeping their wings outstretched, allowing themselves to be mechanically propelled. Then again, have not the Wright Brothers proved beyond doubt, with their rough, crude machine, that the future of the aeroplane system is enormous?

To those who have watched the albatross, some of which measure 14 feet from tip to tip of wing, gliding on the air with no perceptible movement of the wings, and flying in this way in a straight horizontal line against the wind, it seems that nothing else but success should crown the efforts of exhaustive experiments.

I have made numerous aeroplanes since 1894, and have had some very interesting and successful steering glides with three-foot models on the dart principle fitted with vertical and horizontal rudders, some of the models having propellers driven by elastic. But recently I have been experimenting with models of the Wright Brothers' machine, having obtained excellent results and some very instructive data. I would be interested to know if anyone else has been experimenting with Wright Brothers' aeroplanes in England.

At present I am working on a combination of the Wrights' and my own type, and hope to have some very good results. If immediate steps are taken, I consider motor-driven aeroplanes should be gliding over England by the middle of this summer.

I would be pleased to hear from anyone interested in this subject, and also to send, at an early date, to THE AUTOMOTOR JOURNAL a photograph of one of my 40-inch Wright aeroplanes.

Yours faithfully,

A. V. ROE.

23, Brunswick Terrace,
Brighton.

4 CYLINDERS *v.* 6 CYLINDERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I notice my friend, Capt. Deasy, says that, in common with others, he is interested in the merits of 6-cylinder cars. I am naturally pleased to hear it, and, I hope, prior to his starting his British Company, he will have learned about the advantages of the 6-cylinder and that he will assist in taking the trade from makers of foreign cars, who, from manufacturing reasons, have not yet been able to adopt the 6-cylinder principle, although knowing that it is best and adopting it in the latest cars they are building for competition.

In response to his wishes, it will give me great pleasure to match a 6-cylinder Napier car against a foreign 4-cylinder for a 100 miles race, as suggested by Capt. Deasy, of equal capacity, and will cross to the Continent with Capt. Deasy to decide it.

My 6-cylinder engine will have six cylinders of 6¼-in. bore each, 5-in. stroke. Capt. Deasy could have his four cylinders of not less than equal total capacity, or even greater if he likes. I have no objection to his having four cylinders as large as he likes, providing, of course, that he keeps to the official rules and regulations that the weight of the car does not exceed 1,000 kilogs. in running order on the road.

If, at the same time, he would like to test other advantages, such as silence of the respective cars, wear and tear of machinery, wear and tear of tyres, petrol consumption, and, in fact, any other competitive points, hill-climbing on top speed, slow running on top speed, even running on top speed, and running, say, 500 miles without changing speed at all, always remaining on the top, I should be pleased to agree to all these points, as I feel that an official trial of this sort would ensure Capt. Deasy's factory turning out nothing but 6-cylinder cars and put another nail in the coffin of the foreign car, as there is no doubt it is always pleasing to the user of a motor car to think that the money he has spent on it is helping to keep British workmen rather than foreign ones.

Yours truly,

S. F. EDGE.

January 20th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Captain H. H. P. Deasy, in THE AUTOMOTOR JOURNAL, suggests that the respective merits of 6-cylinder and 4-cylinder cars should be arrived at by a proper trial between the two in the form of a match over 100 miles of give-and-take country, the engines of the cars having equal capacity. It would be interesting if Captain Deasy would state whether his proposal is that the match should be a race pure and simple. If so, apparently he thinks that the question as to which is the better car can be settled by a test of speed and reliability over a distance of 100 miles. I have found that everyday people who are purchasing cars are much more anxious as to the qualities of silence, smoothness, shocklessness, absence of smell, absence of smoke, and luxury of suspension than they are on the question of whether a car will go a mile or two an hour faster than another car. The idea that the chief merit of a car lies in the extent to which it can break the laws of the country is, I think, wrong.

If Captain Deasy's match includes a trial of the two cars on the more important points I have mentioned, I believe that C. S. Rolls and Co. would gladly provide a 6-cylinder car for the purpose of the match, and I would suggest that the jury should consist of three ladies and three gentlemen who have been in the habit of driving in carriages drawn by horses, and who are not wedded to any particular form of motor traction. The two halves of the jury would change cars at the half-distance. I believe that the 6-cylinder Rolls-Royce has a cylinder capacity of 377·4 cub. in., and the 30–40 Martini 340·12 cub. in. Possibly, if the question of speed is, as I suggest, to be left out of the match, Captain Deasy would consider that the capacity of the two engines is near enough for a test of the other important qualities of the respective cars.

Yours faithfully,

Jan. 20th. CLAUDE JOHNSON.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Why so much discussion on the merits of the two engines? One thing only will determine which will be the car of the future —the future itself.

As a purchaser in a position to afford it, I should not hesitate for a moment, but fix at once on a 6-cylinder. As a manufacturer I am catering for both the client who wants a 4-cylinder car and one who wants a 6-cylinder car, but I have a lingering notion that in twelve months' time we shall have only one model "Brooke" car, and that a 6-cylinder.

Only a short time back I was driving a 6-cylinder car with one cylinder missing, but it was hardly noticeable. On the same day I was driving a 4-cylinder car with one cylinder missing, and the difference!

Yours faithfully,

January 22nd. MAWDSLEY BROOKE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I read in your issue of January 13th some measurements given by Mr. Edge, I believe, to your correspondent, Mr. Colebrook. Mr. Edge's letter appeared to answer every point which Mr. Colebrook asked, and clearly showed how well distributed the weight of the 6-cylinder was.

I was somewhat surprised, therefore, to see in your current issue that Mr. Colebrook is not satisfied with the answers he received, and for some unknown reason wishes to suggest that the answers are not what he wished, although they appeared to be quite definite answers to his questions.

The matter, however, has interested me so much that I have taken the trouble to find out the truth.

The first point on which I must join issue with your correspondent is where he says that he has taken the dimensions of a 40-h.p. Mercedes car, in which he says that the design is absolutely up to date. He must surely be perfectly well aware, firstly, that there is no such thing as an up-to-date 40-h.p. Mercedes, as they do not make this model for 1906 type. Secondly, he must know quite well that the Mercedes designers in their more recent cars have very properly put their back wheels further back than they used to have them in the past, and thus enormously increase the weight on the front wheels. Being good designers, they appreciate that a very large amount of the weight of the machinery of the chassis ought to be carried on the front wheels, as with the present heavy bodies and large seating capacity, the back wheels have as much weight as they can carry and need for driving purposes without engine weight.

His next statement, that a 6-cylinder engine has the whole weight placed too far forward over the front wheels, is wrong. Let us be charitable, and hope ignorantly wrong, and unless your correspondent will state what make of 6-cylinder he has seen built in this way, I fear I must question the truth of the statement. I have taken the trouble to measure a 40-h.p. 6-cylinder Napier, and I find that the back of the front axle, instead of being behind any portion of the Napier cylinders, as your correspondent would suggest, is *actually* one inch in front of them.

As to the question of the bonnet being carried over the front axle unduly increasing the weight on the same—certainly. As one with some technical knowledge, I cannot believe that the weight of a motor car bonnet (I have weighed the one that fits over the 40-h.p. engine of the same car, and find that it weighs 18½ lbs.) could have any serious effect that was good or bad on the steering of a car. It would be interesting to see what sort of faulty steering the car has that your correspondent refers to that so strangely has its steering adversely interfered with by the small portion of the meagre weight of the bonnet over the front axle.

Yours faithfully,

South Ealing, W. G. SMITH.

CLAIMS BY THE PUBLIC—INSURANCE OF MOTOR CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—If you will allow me to recite the following particulars they may prove to be of interest to your readers.

On the 9th day of October, 1904, one of our policyholders, a Mr. Baily, riding on his car, collided with a cyclist—a Mr. Norton—and unfortunately killed him.

The police investigated the particulars and decided not to prosecute.

The coroner's jury exonerated Mr. Baily from any blame.

Some little while after a firm of solicitors wrote claiming compensation on behalf of the widow, but upon looking into the facts threw the case up as a hopeless one to fight.

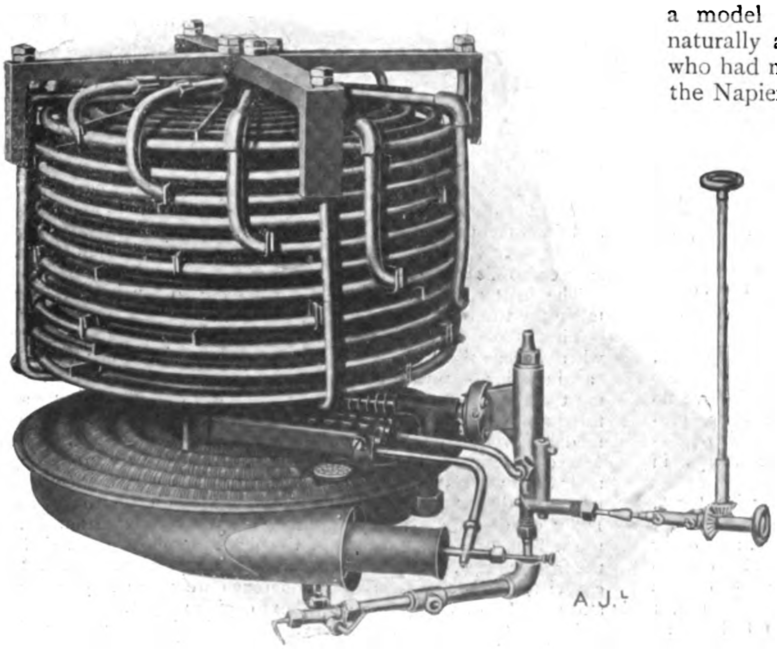
Nearly a year passed when another firm of solicitors began proceedings on behalf of Mrs. Norton, and last week a special jury, in Mr. Bigham's Court (King's Bench), in spite of an apparently very clear case, awarded Mrs. Norton and her son and daughter the sum of £1,500, which with costs means practically an award of £2,000.

Fortunately for Mr. Baily he was insured with us for £1,000, so that he only has to bear himself a loss of £1,000 instead of £2,000. This case, however, shows very clearly the value of sympathy in a third party action, especially when a motor car happens to be involved.

Yours truly,

FREDERICK THORESBY,
General Manager, Car and General Insurance Corporation, Limited.

1, Queen Victoria Street, E.C.
January 22nd, 1906.



On the present 18-h.p. White Steam Cars, the burner differs from those hitherto employed on this well-known make of vehicle, the chief change being that the whole of the air now enters around the fuel-jet; the burner is therefore closed in beneath. Our illustration shows the new steam generator with the burner in place beneath it; the earlier form of burner—as used on the 10-h.p. and 15-h.p. models—was similarly illustrated by us on July 25th, 1903. Full particulars of the latest White Steam Cars were given in our issue of September 30th last.

Crystal Palace Exhibition.

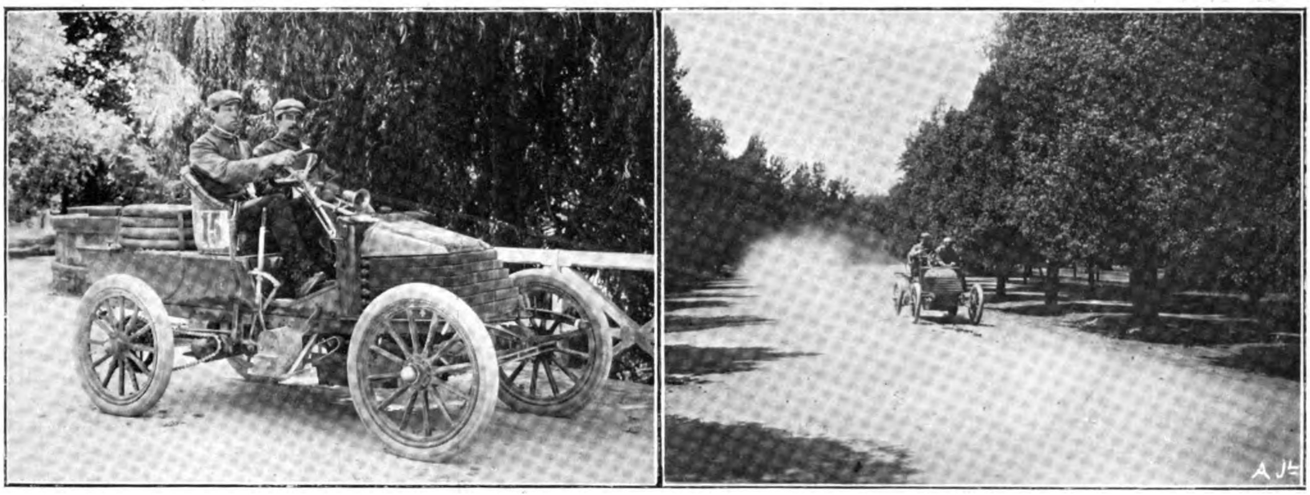
THE Motor Show opening on Friday of this week, closes on February 3rd next. The stand of THE AUTOMOTOR JOURNAL will be in its old place in the centre of the building by the High Level Station entrance—its number is 35. Several novelties, it is announced, will be staged, especially in the motor boat section, of which the organisers are making a special feature. An Itala car, constructed for Queen Margherita of Italy, is an attractive exhibit promised, whilst the Fabry Company will be showing a 100-h.p. racer, and a 200-h.p. 8-cylinder Darracq racer will be on view.

Birmingham Motor Show.

THE second annual Exhibition of motor cars was opened on the 19th inst. by the Lord Mayor at the Bingley Hall, and closes to-day (Saturday). After the Olympia and Paris Shows, no new chassis could be expected to make its *début* at Birmingham, and with the exception of the new 4-cylinder Quadrant car, which is fitted with the Lloyd change-speed-gear—illustrated and described in our issue of November 4th last year—there is practically nothing novel. No doubt a number of local residents, however, were unable to see the Olympia Show, and to these the representative nature of their own Exhibition must have been very gratifying. Such well-known firms as Argyll, Clement, Clement-Talbot, Daimler, Delaunay-Belleville, Humber, Mercedes, Napier, Panhard, and Renault were well represented, either direct or by their agents. Most of the up-to-date cars are of course represented locally, but among those who came up from London especially for the event may be mentioned Messrs. S. F. Edge and J. E. Hutton, both of whom had fine exhibits of the special cars in which they are interested. On the Napier stand was a model of one of the latest 6-cylinder cars, which naturally attracted considerable attention among those who had not already seen the most recent product of the Napier works.

Motor Pupils.

MOTOR car schools which do not teach the aspiring pupil automobilism, have been responsible for a good deal, but it is satisfactory to find that the Forman Motor Company, of Coventry, who took a pupil with a premium of £20, and were alleged, instead of making him an expert motor engineer and driver, to have converted him into a burglar instead, are absolved from the heinous charge. An action was brought by the parents of the young man (who, it now appears, had a "past") for the return of the £20, and it was alleged that the defendant company taught him so little, and made things generally so unpleasant for him, that he came to prefer the profession of burgling to that of chauffeuring. The evidence, however, showed that he learned nothing because he wished to learn nothing, and that the only engineering job he actually executed when on the works, was the manufacture of a tool for opening doors, locks, and safes, popularly known as a "jemmy." Under the circumstances it is not surprising to learn that the jury gave a verdict for the defendant company.



MELBOURNE-SYDNEY RELIABILITY TRIAL.—We have received the above photographs from the Wolseley Motor Car Company, and they depict one of the Wolseley cars (No. 15) which took part in the test. In the contest this car was particularly unlucky, having to cross an exceptionally rough country, owing to the road being blocked near a bridge by another car which had met with an accident. In endeavouring to pass ovei the loose sand and big stones, the car rolled aside and struck the front wheel against a boulder, bending the axle badly. Yass, about 11 miles distant, was with considerable difficulty reached under the conditions, but in spite of this, when the axle had been straightened out, the car steered and travelled splendidly, averaging about 28 miles an hour through the hilly country into Goulburn. Unfortunately, the mishap caused a loss of 3 hours 12 minutes, equal to 192 points.

Popularity of the "Yellow Cover."

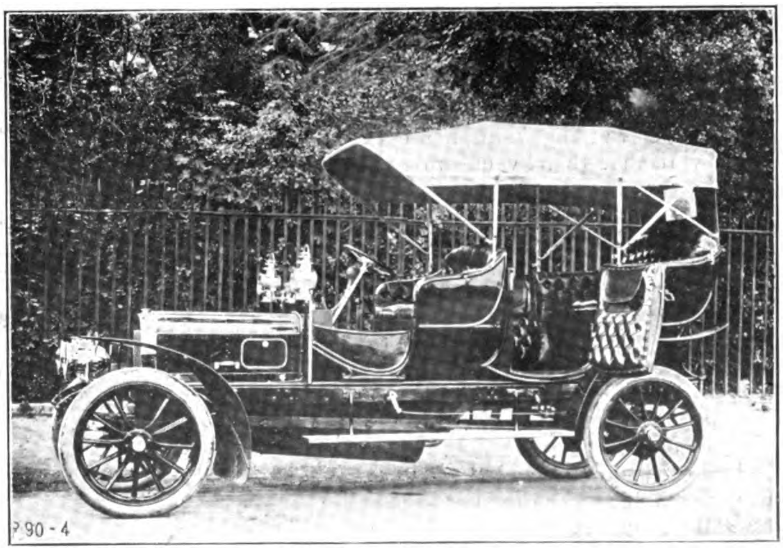
We hear on good authority that at a Service fancy dress ball at Chatham last week, one of the most successful costumes represented The Automotor Journal (yellow cover). We are pleased to hear of this as emphasising the widespread popularity of our Journal. We need hardly say this costume was selected without the slightest suggestion from anyone connected either directly or indirectly with our editorial or commercial staff.

Motor Car in Romance.

The motor car has played quite a romantic part recently. We do not so much refer to the unsuccessful attempt made by a Parisian *viveur* to abduct a variety "star" in a motor car filled with flowers, as to the romantic affair which has set most of Europe talking, the elopement of Count Francis Erasmus, the heir to the territorial county of Erbach in the Odenwald, which has recently been announced. The young Count insisted on marrying a peasant girl who resided in the neighbourhood of his ancestral castle. There was the customary family quarrel, and various other quarrels, and, finally, one morning, the heir of a title and estates—which have been in his family since the days of Charlemagne—walked out of the castle, which is one of the most splendid and widely celebrated in Germany, met the object of his affections at some distance in the forest, and whirled her off to France in a motor car. The pair finally found their way to London, where they were married. The automobile was requisitioned, as the young Count anticipated forcible opposition on the part of his family. It is one of those strange coincidences which history sometimes provides that the origin of the Erbach family was from a not dissimilar *mésalliance*, the Counts of Erbach tracing descent from the union of Charles the Great's daughter Emma with his celebrated secretary, Eginhardt.

Back to the Road.

The establishment of road motor 'bus or motor coach service for which the Vanguard people are primarily to be thanked, is leading to further developments in the same direction, and a number of vehicles styled motor coaches are, we understand, under construction and will be placed in service shortly by a company entitled the London and South Coast Motor Service, Limited. The main object will be to familiarise passengers with the beauties of the scenery in the southern counties while at the same time charging very moderate fares.



DESIGN IN CARS.—A well-designed 20-h.p. Thornycroft Car, belonging to Mr. A. M. S. Methuen, which during the election for the Guildford division of Surrey did yeoman's service in the automobile cause, conveying in one case eleven voters at once to the poll.

One of the new White model cars, showing the latest style of American body. An interesting point in the photograph is the crouching beast which is seen on the rocks, and is carved out of stone, this forming a special attraction to many tourists who visit the district.

Objections to the Motor Road.

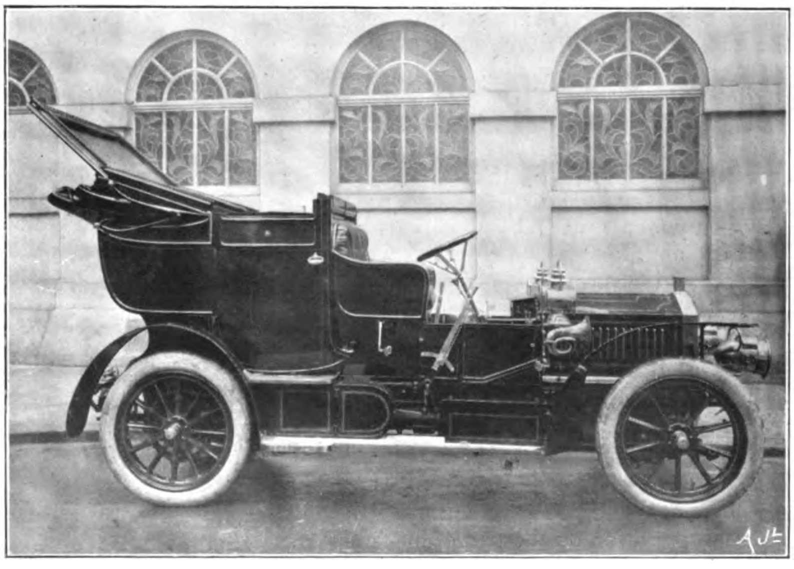
We are not sorry to find that the proposed Bill for permitting the construction of a "motor road" from London to Brighton, or more accurately speaking, from Croydon to Patcham, is commencing to evoke public opposition. Already an objection has been raised in regard to the title, on the ground that it is not proposed to really construct the road from London to Brighton, but from Croydon to the village mentioned above, and that the title of the Bill is therefore a misnomer. Other grounds of opposition are that the scheme, if sanctioned, would confer large and important powers hitherto usually conferred by Parliament only on railway companies (a point with which we dealt editorially last week), while, in addition, the scheme, as originally proposed, suggested that the road would be confined entirely to automobiles and not to vehicles propelled by motive power obtained from some outside source (this, we presume, refers to the suggestions that have been put forward for providing electric power from trolley wires for electrical vehicles).

The Hon. Arthur Stanley, M.P., Chairman of the A.C.G.B.I.

We beg to tender our heartiest congratulations to the Hon. Arthur Stanley, the Chairman of the Club and Motor Union, on his return to Parliament for the Ormskirk Division of Lancashire. The presence of the chairman of the two bodies in the House of Commons during what will probably be a fateful session for automobilism, is of the highest importance in the interest and welfare of the movement.

Edinburgh Exhibition.

This week-end the annual Motor Show at the Scottish capital opened for the usual week's exhibition of the leading types of cars in the country. Naturally such Scottish firms as the Argyll and the Arrol-Johnston are strongly represented, whilst all the well-known makes, such as Napiers, Daimlers, Wolseleys, Iris, Rolls-Royce, Panhards, Mercedes, De Dion, Fiat, Crossley, De Dietrich, Swift, Ariel, Clement, &c., are in evidence either directly or through their agents. It is yearly becoming more popular for a number of sportsmen to drive cars up by road, and amongst these this time will be found Mr. Charles Jarrott (22–28-h.p. Crossley), Mr. J. W. Stocks (24-h.p. De Dion), Mr. A. E. Perman (Iris), Messrs. Victor Miller and D'Arcy Baker (24–40-h.p. Fiat Omnibus). Mr. Jarrott and Mr. Stocks are running "in harness" in friendly rivalry, thereby ensuring an enjoyable sporting run. These two old "cracks" were to start together from the General Post Office at 9 p.m. on Friday of this week *en route* for the General Post Office, Edinburgh. The intention is to run straight through, keeping to a time-table throughout, allowing for the completion of the journey in 20 hours—just up to the legal limit. Both will, at the same time, endeavour to make engine non-stop runs. Mr. A. E. Perman started earlier in the week upon his little trip, he combining business with pleasure by calling at Leicester and Darlington *en route*, where he had arranged for special demonstrations with his Iris car. Mr. Perman was due at Stand 94–95 at the Edinburgh Show to-night (Saturday).



In our photograph is seen the new 18-h.p. Napier Landaulette which has just been built for the Hon. J. W. Lowther, the Speaker of the late Parliament.

CLÉMENT CARS
HEAD THE POLL
THE CLÉMENT MOTOR Cº Lᵀᴰ 3. Leicester Sᵀ London W.C.

A well-designed up-to-date "election" poster just issued by the Clement Motor Company.

COMMERCIAL POINTS.

What's in a Name?

MESSRS. CHARLES JARROTT AND LETTS, it is generally understood in the automobile world, are very extensive dealers in motor cars. Their name, however, appears to be fairly familiar outside the automobile industry, as we learn that quite a number of people have written them lately asking them to supply them with their diaries for 1906, against remittance. Probably this is accounted for by the rate at which most people now try to get through life, as the confusion probably arises by taking a glance at "Charles," the first name of the firm, skipping the centre, and noting only, in addition, the last name, and thereby assuming that they are the proprietors and vendors of "Charles Letts'" diaries.

AT the Berlin Automobile Exhibition in February, the Continental Caoutchouc and Gutta Percha Company, Hanover, have arranged to hold a tyre fitting competition, in which they will offer cash prizes to the value of £50 to those accomplishing the fastest times in fitting Continental motor tyres.

THE Birmingham Motor Car Company advise us that they are removing to more extensive premises at 208, Corporation Street, Birmingham, exactly opposite the Law Courts. They will then have very extensive show-rooms, and will have a specially equipped repair shop and garage available for all emergencies. They inform us that they will be in a position to repair at least thirty cars at one time and to garage more than that number, the ground floor alone covering an area of 9,000 square feet. The company are the Midland agents for the Argyll cars, the Delaunay-Belleville, and Sunbeams, spare parts of which makes are always kept in stock.

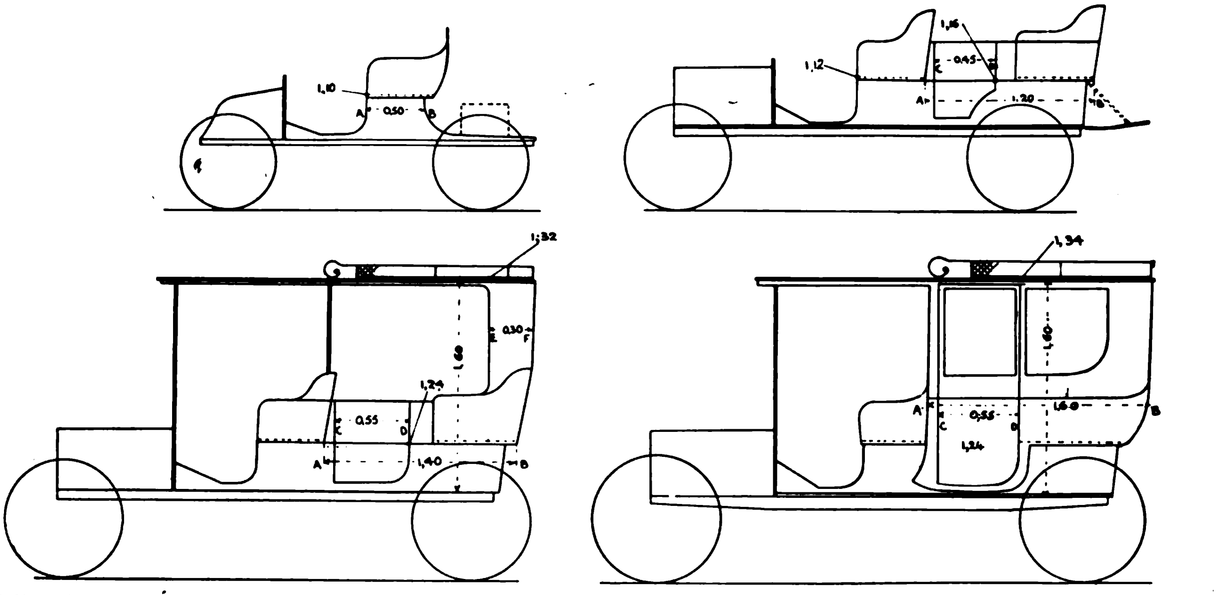
Mr. A. E. Perman on his Iris car, which he is driving to Edinburgh Exhibition.

A USEFUL desk blotter is to hand from the Shrewsbury and Challiner Tyre Company, Limited, of Ardwick Green, Manchester. It is specially convenient, as it is fitted with two flaps which close over when not in use, and thereby serve for the safe keeping of current papers in abeyance. The company will be pleased to forward one of these desk companions to any of our readers free upon receipt of name and address.

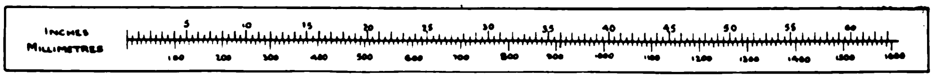
MAJOR RENTON, the Liberal candidate for Gainsborough, has selected a 4-cylinder National car, which, with the exception of the engine, will be of similar design to the 3-cylinder National which was Major Renton's first purchase.

THE British Automobile Commercial Syndicate, Limited, have been appointed the sole London selling agents for Clement Talbot cars manufactured in England.

INFORMATION comes from Calcutta that a proposal to provide two motor vans for the carriage of samples of tea from the sale tea warehouse at Garden Reach to the distributing centre in the city has been approved by the Port Commissioners, and an order has been placed for two 16-h.p. two-cylinder Albion motor delivery vans.



CIRCUIT EUROPÉEN.—Diagrammatic sketches indicating the sizes and types of carriage bodies, specified by the rules for each of the four classes. Certain of the dimensions indicate the width at those points, and all the seat measurements are taken at the top of the boot ("*parclose*," meaning the space beneath the seat); the width is measured from outside to outside, except in the case of the canopy, where the weathering (*les jets d'eau*) is not included. In all cases, the weight of the bodies (75, 200, 375, and 450 kilogs. minimum) is to include mudguards, steps, and the usual lamp brackets.



For the convenience of those wishing to convert metric figures of measurement into English feet and inches, we give this comparative scale, and believe that it will be found useful in connection with the above diagrams that refer to the Circuit Européen.

NEW COMPANIES REGISTERED.

Allsop Motor Syndicate (Limited).—Capital, £6,000 in £1 shares. Object, to acquire patents relating to petroleum engines, by agreement with R. O. Allsop.

Glasgow Motor Haulage Company (Limited). —Capital, £20,000 in £1 shares. (Scotch Co.)

Motor Drivers' Union (Limited).—Capital £1,000 in £1 shares. Object, to acquire the business carried on by Riski Medawar, at 47, Victoria Street, Westminster, as the Motor Drivers' Union.

Motor Lorries (Limited), 7, Thomas Street, York.—Capital, £10,000 in £1 shares. Object, to acquire the business carried on by J. E. Gibbs at Thomas Street, York, as John E. Gibbs.

N.A.G. Automobile Company of Great Britain and Ireland (1906) (Limited), 11, Gresham House, Old Broad Street, E.C.—Capital, £5,000 in £1 shares.

New Motor and General Rubber Company (Limited). —Capital, £1.500 in £1 shares. Object, to acquire from T. Warwick the business of rubber and general tyre manufacturing and repairing carried on at 61, High Street, Shaftesbury Avenue, W.C., as the Motor and General Tyre Company. First directors, T. Warwick, W. Turner, and J. Brewer.

Reliable Tyre Company (Limited), 12, St. John's Lane, Liverpool.—Capital, £5,000 in £1 shares. Object, to adopt an agreement with D. L. Chalmers, and carry on the business of manufacturers of tyres, &c. J. B. Atherton, first managing director.

St. James' Motor Company (Limited).—Capital, £1,000 in £1 shares. Object, to acquire the business carried on by R. Medawar at 199, Piccadilly, W., as the Motor Drivers' Institute, and at 9, Carteret Street, W., as the Imperial Motor Garage Company. First directors, R. Medawar (managing director and chairman), W. C. A. Jollands.

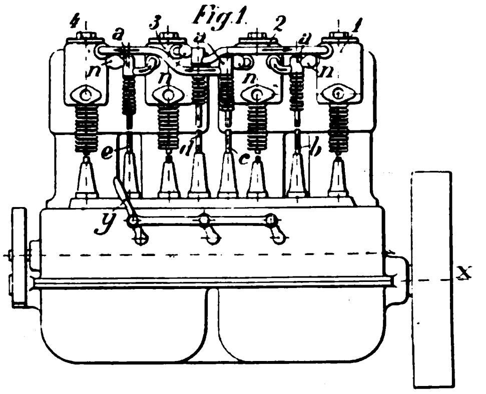
◆ ◆ ◆ ◆

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

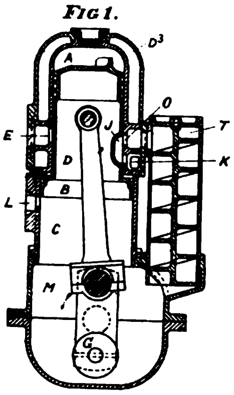
2793. 10th February, 1905. Improvements in Automatic Igniting Devices for Explosion Motors having a Plurality of Cylinders. Marius Chevalier, 18, Avenue Laumiere, Paris, and Francois Regnaut, 68, Boulevard Sébastopol, Paris. This automatic ignition device for explosion motors is more particularly adapted for motors with four cylinders, although it may be used with motors having a larger or smaller number of cylinders, and the object is to utilise part of the exhaust gases from one or more cylinders for automatically producing the ignition of the fresh gases in the other cylinder or cylinders. There are five figures. Fig. 1 is a front elevation of the motor provided with the improvements. The invention is applied to a four-cycle motor with the four cylinders, 1, 2, 3, 4. An explosion is produced at each half revolution of the motor shaft, X, and these explosions usually take place in the cylinders in the order 1, 2, 4, 3. Each cylinder is provided at or near its upper part with a similar valve, *a*, in a valve-box connected to the cylinder by tubes surrounded by heat-insulating material in order to avoid cooling. In the order of ignition given above the tubes are so arranged that the first cylinder, 1, is connected with the second 2; the latter cylinder with the third 3 and the third cylinder back to the first 1. Between each cylinder and its respective valve is located a chamber, *n*, provided with an outer jacket or casing; the chamber being in communication with the cylinder by means of a valve. The valves, *a*, in the respective boxes are operated by rods, *b c d* and *e*, the rods being driven by cams mounted on the intermediate shaft of the motor on which are also mounted the exhaust cams. Each cam is formed of a group of cams of the same profile and of the same width as the lower end or shoe of the respective valve rod, each element of a group being connected or grouped together and keyed on the shaft at a different relative angle. These groups of cams rotate with the common driving shaft, and are adapted to slide longitudinally thereon with slight friction on a feather provided for each. This displacement is effected by means of a lever, *y*, and rods adapted to simultaneously operate the four groups of cams, a lateral displacement being thus obtained which causes the various cams of a group to act successively on a valve rod by the angular difference of each, and so produce the advance or retardation of the ignition by effecting an advance or delay in the opening of the valve communicating with the next cylinder. Each group of cams may also be made in one piece, having a helicoidal profile which produces the progressive advance or delay of the ignition. The pipes between the cylinders are provided with an insulating coating of asbestos for reducing loss of heat.—January 3rd, 1906.

Fig.1



29214. Arthur F. Scott, M.I.Mech.E., 171, Swan Arcade, Bradford. This invention relates to two-stroke-cycle internal combustion engines in which the exhaust is controlled by the piston, and its main object is to provide an engine working with gas or an explosive mixture in which a scavenging charge of air is admitted before the explosive charge enters, and which may be cheaply constructed. There are five figures. Fig. 1 is a sectional elevation. The motor cylinder, A, has an extension of larger diameter, C, and is fitted with a piston of two diameters, D and B, the part of larger diameter, B, having its underside open to the crank chamber, M, and forming a pump, while the upper trunk part, D, forms the motor piston. The lower part of the motor cylinder, A, contains exhaust ports, E, on one side and on the other side ports, O, connected with the crank chamber, M, by means of a separating pipe or passage, T, which has a spiral course as shown, so as to give length of passage. The motor and pump cylinders, A and C, contain respectively air and gas mixture inlet ports, K and L, and the motor piston, D, is provided with a deflector, D^3, on the top, and has a recess, J, in its side, and the whole is arranged, so that when the piston arrives at the top of the stroke the recessed port, J, therein connects the air inlet, K, with the port, O, leading into the top of the separating passage, T, and at the same time the pump part, B, of the piston uncovers the gas inlet, L, to the crank chamber, M, and the partial vacuum in the latter causes the scavenging and explosive charges to simultaneously enter the separating passage, T, and crank chamber, M, respectively, the proportions of the two charges being dependent on the size or openings of the two inlets, K (or O) and L. The scavenging air is thus held in the separating passage, T, and when the piston approaches the bottom of the stroke and has opened the exhaust, E, the air enters the cylinder by the ports, O, and is followed by the gas mixture when compression and ignition take place in the usual manner. On account of the pre-admitted air in the cylinder a small rich explosive charge may be used, and being held back this distribution tends to prevent any loss at the exhaust ports, and also to avert danger of explosion in the crank chamber when the piston uncovers the ports, O, owing to the interposing column of air in T. The scavenging air also tends to raise the mean pressure in the cylinder, and to enable the engine to run with greater range of load. When a single cylinder is used the inlets to same are provided with enough pipe to take the gases moved to and fro by the annulus, Z, of the piston, so as to avoid waste of gas.—January 3rd, 1906.

FIG 1.



Patent Specifications Published.

Applied for in 1904.

Published January 18th, 1906.

27,731. R. F. CAREY. Driving and reversing mechanism.
28,473. L. A. C. LETOMBE. Explosion motors.
28,760. F. MULLER. Variable speed transmission gearing.
29,049. MAXWELL-BRISCOE MOTOR CO. Power-transmitting mechanism and control apparatus.
29,214. A. F. SCOTT. Intl. combn. engines.
29,248. F. C. IHLER. Motor vehicles.
29,292. T. CLARKSON. Regulation of liquid fuel burners.
29,425. L. SCHMITT. Cooling apparatus.

Published January 25th, 1906.

21,320. H. F. FULLAGAR. Regenerative intl. combn. engines.

Applied for in 1905.

Published January 18th, 1906.

2,793. M. CHEVALIER AND F. REGNAUT. Automatic igniting devices.
4,978. G. IDEN and others. Friction clutches.
5,860. W RUDHAM AND G. W. OWENS. Variable pitch sprocket-wheel for motor cycles.
6,748. T. CLARKRON. Steering gear.
8,654. ST. HELENS CABLE CO., LTD., AND F KENYON. Rubber-tyred wheels
8,741. F. M LEAVITT. Starting valves for automobile torpedoes.
11,404 G. L M. DORWALD. Carburettors.
19,517 C. HUBERT. Starting mechanism.

Published January 25th, 1906.

1,035. H. S. MOORWOOD AND J. F. BENNETT. Carburettors.
1,867. E. A. RADNALL. Brakes.
2,563. C. BROWN and others. Carburettors.
2,629. C., H., AND A. SHAW. Variable speed gearing.
4,863. R. M. A. B. MUNRO. Brakes for motor cycles.
5.846. W. B. HAYDEN. Sparking devices.
6,482. G. GREEN and others. Intl. combn. engines.
7,504. E. EISEMANN. Ignition devices.
7,553. A. T. COLLIER AND REILLOC TYRE CO. LTD Wheels and tyres
7,796 M. SAUNDERS. Variable speed gearing.
10,532. W. WHISTON. Acetylene lamps.
15,242. F. J. SCOTCHMER. Sparking plug.
17,265. E. PILKINGTON. Driving belts.
17,309. A. C. STEWART. Carburettors.
17,732. R. W. H. RODNEY. Oil engines.
18,326. J. S. MORSE. Speed recorders.
20,003. G. RICHARD. Air carburetting apparatus.
20,308. T. F. B. AND A. BEAULIEU AND L. SAUVEGRAIN. Pneumatic tyres.
1,173. A. H. NICHOLSON. Igniting installations.
52,129. L. M. G. DELAUNAY-BELLEIVLLE. Cooling apparatus.

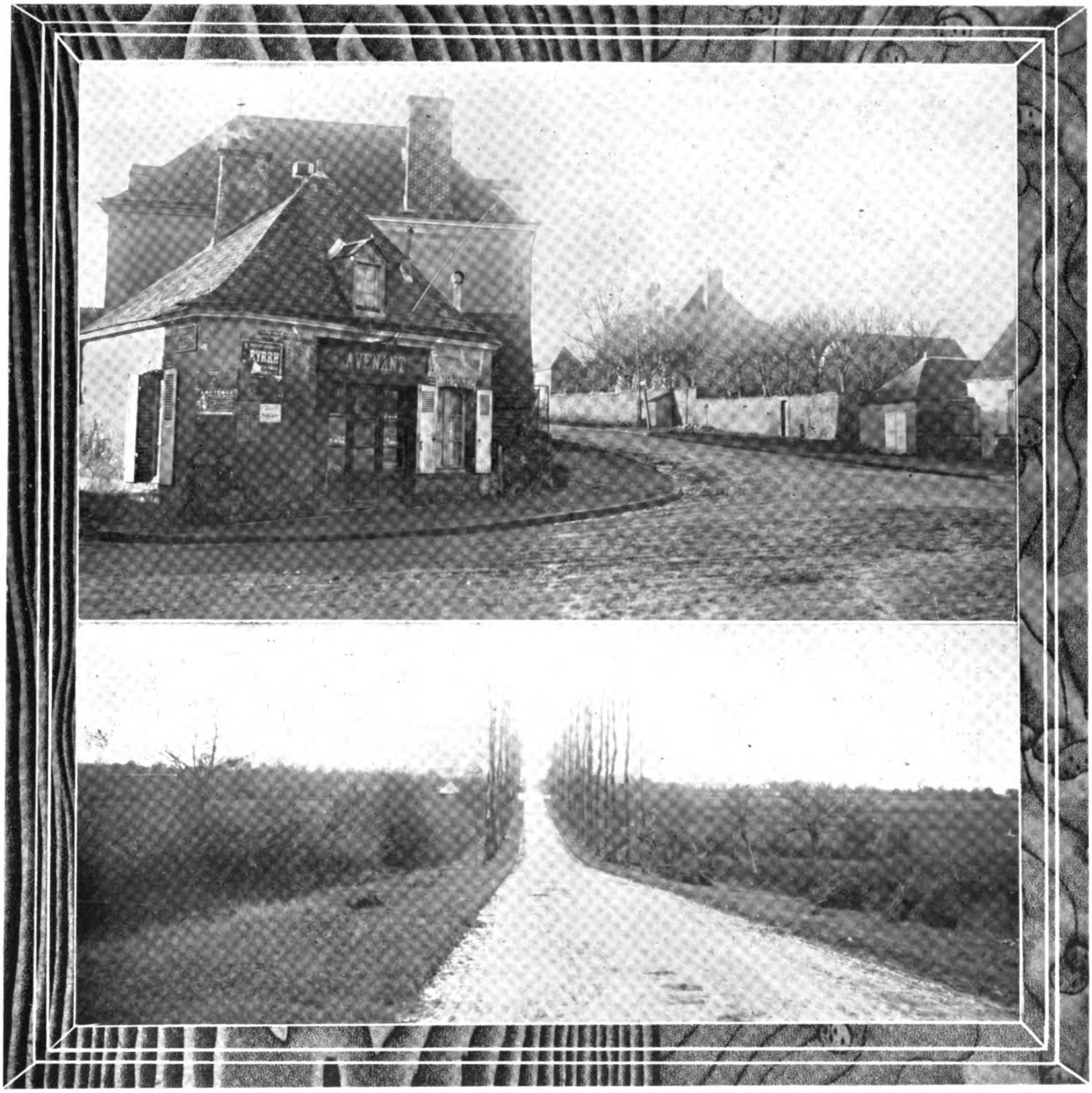
Automotor Journal, February 3rd, 1906.

The AUTO MOTOR JOURNAL

(YELLOW COVER).

A Record and Review of Applied Automatic Locomotion.

No 265. (No. 5, Vol. XI.)] FEBRUARY 3RD, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.



THE SARTHE CIRCUIT—the Course of the A.C. de France Grand Prix Race. We were enabled last week to give a sketch map and a series of extremely interesting scenes on the Sarthe Course, upon which the A.C. de France big race takes place this year, probably in June. Above we publish two more characteristic photographs on the Course. The top picture is a sharp corner in the village of Connere, and the lower picture shows a type of the many poplar-lined straight roads over which the competitors will race. This photograph depicts a stretch between Bouloire and St. Calais.

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DIARY OF FORTHCOMING EVENTS.

British Events.

Feb. 9–17 ...	†Manchester Motor Show.
Feb. 9–17 ...	Liverpool Motor Show.
Feb. 9–17 ...	†Newcastle Motor Show.
Feb. 10 ...	Tri-car Hill-Climb, River Hill (Lewisham A.C.).
Feb. 19 ...	Scottish A.C. (Western) Annual Dinner.
Feb. 26 ...	*4,000 Miles Tyre Trials.
Feb. 26 ...	*Lamp Trials.
Feb. 26 ...	*Speedometer Trials.
March 8 ...	A.C.G.B.I. General Meeting.
March 9–17...	†Glasgow Motor Car Show. †Sheffield Motor Show.
March 24–31	Cordingley and Co.'s Motor Show.
June 13–16 ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
Aug. ...	*Van Trials.
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

Feb. 3–18 ...	Berlin Motor Show.
Feb. 3–18 ...	Turin Automobile Show.
Feb. 19–25 ...	Paris Voiturettes and Tri-car Trial (*Les Sports*).
March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
April 1–17 ...	Budapest Exhibition (A.C. of Hungary).
April–May ...	Milan Exhibition.
April ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 13–14 ...	Tour de France (Motor Cycles and Voiturettes).
June 10–16 ...	Herkomer Cup.
June 28–29 ...	Kiel Motor-Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15–16 ...	Mont Ventoux Hill-Climb.

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* Automobile Club of Great Britain and Ireland Events and Papers.

† Members of the Motor Union are admitted free to these Exhibitions on presentation of their cards of membership.

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PASSING EVENTS.

The Motor Car in Elections. The election which has just been concluded, sensational as it has been in many respects, and notable as perhaps no election held in this country has ever been before for a complete reversal of popular opinion, will be memorable probably in the next degree for the *rôle* which automobiles have played in it. The automobile is, in fact, responsible, as far as we are able to judge, from the particulars and statistics that we have gathered, to a very large extent, for the enormous polls recorded. This is particularly the case in country districts. No distance has been too great for the cars under the control of enterprising election agents to fetch voters from, and on some occasions even those who are still on the register and have left the district have been fetched distances of a hundred or more miles. As far as an opinion can be formed at present, the results of the election, though shattering many hopes and proving a regular earthquake to one of the great political parties, inspires plenty of hope for the future of automobilism. Nearly 150 of the Members elected have expressed themselves as friendly or at any rate favourable to the new locomotion, and that is a fine phalanx, exceeding in numbers, we believe, the friendly Members in either of the last two Parliaments. The new Parliament will be probably in many respects unlike nearly all that have gone before it, but on the whole we are disposed to think that it will be less prejudiced, and prejudice, after all, has been the one great enemy of the movement. From an unprejudiced Parliament, in which there is a solid phalanx of Members favourable to the new locomotion, we have everything to hope. The most notable result of the elections has been the enormous increase in the number of representatives of labour, so-called, which of course really means the representation of skilled labour, of the engineering and allied trades. These Members, we feel convinced, will be among the very first, if they consult their true interests, to realise the importance of affording every support to a growing industry which already employs thousands of skilled British workmen, and will, if not hampered by restrictive legislation, in the future employ hundreds of thousands more. On the whole, therefore, there is no reason whatever to be pessimistic as regards the attitude in the new Parliament towards the automobile movement in Great Britain.

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Romantic Automobilism. "Qu'on est bien a vingt ans?" When one is twenty, when one is a king, when one is very much in love with a charming princess, and when as the single *amari aliquid* the ancient custom of your country makes it a violation of all precedent to sleep out of it (unless a regent is formally and solemnly appointed), then the motor car comes as a gift of the gods. The King of Spain has been giving a demonstration of its value in annihilating distance, the thing which every lover, whether in a palace or a cottage, always seems to want to do most. Princess Ena has been staying at Biarritz, probably because it is the most comfortable resort in the near neighbourhood of Spain, and that some quaint remnant of starched and stilted Spanish etiquette—the sort of thing that has survived from the days when the Spaniards invented the ruff and the pointed collar—prevents the future bride of the Spanish monarch from residing in Spain till she makes her formal entry into the country. So King Alfonso has had to return every night to San Sebastian, the nearest town in his own dominions. He has been apparently in the habit of remaining at Biarritz till about 12 o'clock at night, and usually arrives there at any time from 8 to 10 the following morning. Nothing but the motor car could have enabled him to accomplish this. Even the most prosaic dowager can imagine what it means to the young monarch to be able to race towards the French frontier with all the speed at which a high-class modern automobile is capable. If to be twenty, even in a garret, was to Beranger a recollection of delight (*dans un grenier qu'on est bien a vingt ans!*), what must it be to be a king—almost an absolute one—to be in love, and to have a 60-h.p. car!

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More of the Motor Barge. The "Duchess" of our canals—the motor barge fitted with a Thornycroft gas-plant—continues on her peregrinations, and has now successfully arrived at Manchester, having had many divers and weird adventures *en route*, not the least noticeable amongst which was her experience with the Board of Trade returns, which, according to Mr. Thomson's interesting report to the *Standard*, appear to have indicated that certain of the locks in Staffordshire are only 17 ft. 1 in. in width. The "Duchess" is 17 ft. 2 ins. in beam. In spite of the Board of Trade returns, however, she successfully got through these locks—a phenomenon which suggests that if we desire accuracy, even about the organisation of our own country, we shall soon have to obtain it from "foreign Consular reports." Anyhow the "Duchess" got through, and arrived in the Manchester Ship Canal, though she had to leave Birmingham with one blade missing from the 3-bladed propeller with which she originally started. In the Manchester Ship Canal she was requisitioned, besides the 5½ tons of bricks which she had carried from Birmingham, to tow two loaded and four empty barges—a task which, in spite of the handicap caused by the condition of her propeller—she accomplished most successfully. With this tremendous load she covered the 30¼ miles between Ellesmere Port, at the entrance of the Ship Canal, and Manchester, in five hours, or just a shade over an average of 6 miles per hour.

◆ ◆ ◆

A Hint of what is Needed. It will thus be seen that as soon as the motor-propelled barge got into a broad and comparatively deep waterway, she rather more than doubled her average speed on clear stretches between locks in other parts of the country. We do not gather that the difference in speed was altogether, or even mainly, due to difference in the general traffic. We believe the improvement in speed to have been due mainly, if not altogether, to the increased width and the increased depth of the waterway. The impedance produced by propelling a large barge, and particularly a barge towing other barges, in an ordinary narrow canal (increased when it has to meet or pass other barges), is enormous, and out of all proportion greater than what it is in relatively open water, where the back-wash off the banks, and the peculiar frictional effects produced by being very near the bottom, are practically non-existent. The performance of the motor barge on the Manchester Ship Canal indicates what the suction-gas engine can really do, for it appears to have done quite as well as a 30-h.p. steam-tug, in spite of the fact that one of the blades of its propeller had been broken off. The conclusion to be drawn, however, seems to be that if much improvement as regards the speed and capacity for dealing with the transport of goods is to be expected on our canals, if motor propulsion of barges is to be taken full advantage of, the canals themselves will have to be widened and deepened, in addition to the introduction of arrangements which we have recently alluded to, for diminishing the number of locks. If the canals are to remain as they are, little will be gained by having even 24-h.p. motors on board barges. The best method (under existing conditions) will be to have small motors which will propel barges at about their present customary pace, with a minimum expenditure of fuel. Of course, in general, provided that the whole power can be usefully employed, the bigger the engine the greater the economy of fuel effected, but if circumstances are such that the engine cannot advantageously put forth its full power, then economy lies in the direction of using engines of a size suitable to the conditions, and economising on their consumption as much as possible. Whether the suction-producer is suitable for smaller engines, whether its economy will not be seriously diminished if adapted to them, is at present a somewhat open question. But on its solution, we fear, depends the question whether our canals will be found of any great value for modern transport as they are at present, or whether, to make them of real national value and utility, the country will not be compelled to put its hand into its pocket, and hand out a very considerable sum.

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Dusty Trophies.

When most low-lying country presents a pleasing lake-like appearance, and when most of the rivers that water the British Islands are flowing "in spate," one may discuss the dust problem more academically and in a more equable frame of mind, than when angry householders are writing to *The Times* in the dog days threatening to shoot at motor cars with buckshot, or to have district councillors smothered in the dust of the roads which they are supposed to keep in order. It is quite appropriate, therefore, that our contemporary, *The Public Health Engineer*, should recognise that this is the right time of year to lay plans for combating the dust fiend. Inspired with the best intentions and anxious to benefit the public health, the automobile movement, and the happiness and comfort of dwellers in country villages, *The Public Health Engineer* is offering medals of gold and silver (we mean both a gold medal and a silver medal) for the best papers dealing with the question. Without presuming to suggest that we should be awarded one of these trophies, we would offer the following remarks on the dust question for the consideration of our enterprising and public-spirited contemporary.

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Governing Principles.

As regards the great problem of eliminating dust from our high-roads, the period of mere discussion would seem to have been passed—*der Worte sind genug gewechselt*—and all experts and authorities who have really studied the question are coming to a concensus of opinion that dust prevention is of two kinds—the *preventive* and the *palliative*. By the palliative we mean applications of more or less tarry or oleaginous products, whether treated so as to be capable of mixing with water or not, applied to the surface of the road after it has been built up in the ordinary way. Of these, the most efficient in our experience during the summer months appears to be the simple treatment with hot tar, but, as has been pointed out sufficiently often by ourselves and others, this process suffers from the terrible disadvantage of making the roads a perfect quagmire of a peculiarly slippery and dangerous kind, as soon as winter conditions prevail. The other palliatives seem to be good only if frequently renewed, and then the cost becomes excessive.

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A Permanent Job Essential.

By the permanent recipes we mean either incorporating some material, preferably tar, with the actual road metal, and using material thus prepared to make up the road in the first instance, or adopting some such method as facing the road surface in a special manner, say, with small, smooth granite sets, as adopted successfully in Germany for some years past and recently on a short stretch in Liverpool. Both methods, when properly carried out, and when proper materials are employed, appear to be very satisfactory. They stop, or practically stop, all dust in the driest weather, and do not become unduly greasy in wet weather or in winter, while adding very considerably to the life of the road. The initial cost, however, is necessarily greater than the old-fashioned methods of making up roads with raw stones, spreading them with dirt, and rolling the whole mud-pie down flat with a steam roller. How far the initial cost will be curtailed by diminution of upkeep is one of those things on which adequate statistics are hardly yet available. But it is in such directions as these that we think the solution of the problem must be sought, even if the total cost is ultimately greater. We are by no means sure that increased total cost would really result. But even if the attainment of dustless roads (which should, be it understood, also mean mudless roads in winter), does prove more costly, it is—considering the great increase of locomotion in recent years—indispensable in the interests of the public health of the community, quite as much as it is called for by consideration for the comfort of dwellers on our roadsides. Under these circumstances, while recognising the intentions of the *Public Health Engineer*, we think that the direction in which the problem should now be attacked is rather by offering the medals or other encouragement for perfectations in the methods of the permanent kind to which we refer, or for the ascertaining of statistics regarding the relative cost of road making and upkeep on such principles, while if the *Public Health Engineer*, or any other public benefactors, wish to disburse further sums with the same benevolent purposes, they might dedicate them to the best scheme for propagating a knowledge of the principles of road building among district councillors, for—until further legislation takes the question out of their hands—it is our district councils who mainly stand in need of conversion and enlightenment.

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More New Laws Suggested.

It is stated that the effect of the large number of motor omnibuses that are now running in the Metropolis upon the general traffic has been so considerable that the L.C.C. will shortly consider whether any alterations in the laws upon the subject are necessary. We sincerely trust that this does not mean that any legislative attempt will be made to handicap the motor 'bus for the benefit of the electric tram.

THE 1906 SPYKER CARS.

High-class workmanship and materials in the construction of the chassis, silence in the running of the engine and transmission, and dustlessness in the motion of the car, have been three characteristic features of Spyker cars in the past, and so far at least as the last of these attributes is concerned, there is every sign of a still further improvement having been made in the design of the new models. Comparative dustlessness has hitherto been obtained in the Spyker car by the provision of a smooth metal sheath beneath the machinery and the absence of all low-hanging projections, such as tanks and tool-boxes become when carried at the rear of the frame; this year, however, the famous Dutch firm have clinched their acceptance of the efficacy of their experimental sheathing by forming it as a solid portion of the main frame, and the first chassis constructed in this manner was shown on the British Automobile Commercial Syndicate's stall at the last Olympia Exhibition, and is again on view at the Crystal Palace.

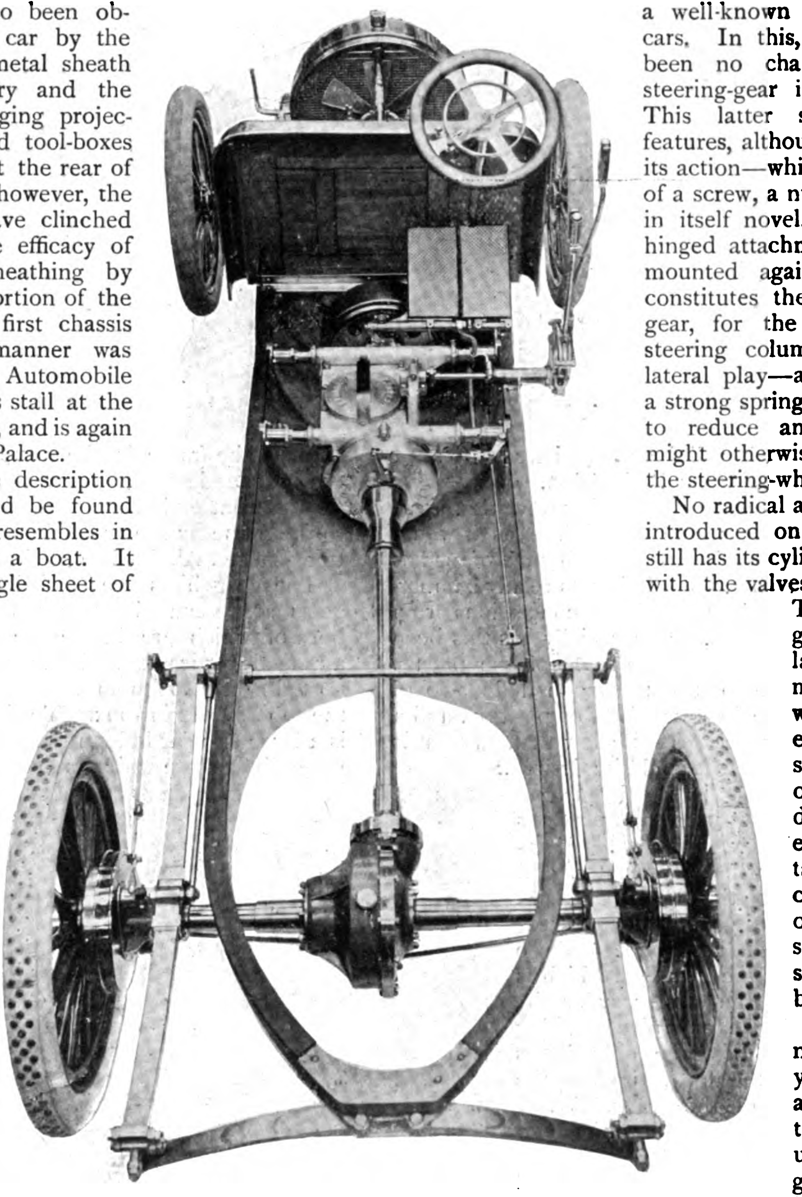


Fig. 1.—The 20-28-h.p. Spyker Car. View, from above, showing the peculiar frame, the suspension of the gear-box, and the "organ" pattern pedals.

No more appropriate description of the new frame could be found than in saying that it resembles in appearance the hull of a boat. It is pressed from a single sheet of steel, and the edges are curled over to form inverted channel section side-members, which are afterwards filled with wood to stiffen them. For the greater part of their length these side-members are straight, but at the rear they curve in towards one another until they nearly meet, and their ends are then joined by a casting, which also forms a bracket for supporting the transverse rear spring. Here again, too, the evolution of the design is obvious, for some time ago the Spyker Company commenced the practice of supporting the transverse spring—which, in conjunction with the great length of those on either side, is responsible for the very easy riding of the Spyker cars—on an overhanging bracket attached to the rear of the frame. This arrangement was found to be quite satisfactory, but the present system of curving the side member is obviously a natural development with a frame of this type, and one which gives a particularly finished appearance to the chassis. Strictly speaking, the frame has no transverse members, as such, but both the engine and the gear-box are supported in such a way that they supply the necessary rigidity.

The front axle is tubular, and it has cup-shaped ends for supporting the steering-heads in their spherical dust-proof casings, which are such a well-known feature on Spyker cars. In this, however, there has been no change, nor has the steering-gear itself been altered. This latter still has unusual features, although the principle of its action—which combines the use of a screw, a nut, and rack—is not in itself novel. It is the peculiar hinged attachment by which it is mounted against the frame that constitutes the real feature of the gear, for the device allows the steering column to have a little lateral play—against the action of a strong spring—which is claimed to reduce any vibration which might otherwise be transmitted to the steering-wheel.

No radical alterations have been introduced on the engine, which still has its cylinders cast in pairs, with the valves on opposite sides. The commutator and gear-wheel circulating-pump are mounted, as they were before, on the ends of the cam-shafts, which project out beneath the radiator in order to enable these important parts to be accessible from the outside. Needless to say, too, the crankshaft still runs on ball-bearings.

High-tension magneto ignition has this year been fitted in addition to that from the batteries. As usual, there is no governor, the engine being controlled by the driver from small levers above the steering-wheel. A curious feature, introduced as an experiment on one of the first of the new models, and illustrated in Fig. 4, is the spiral exhaust-pipe. It is constructed in this manner in order to give the exhaust-gases a swirling action which will disperse them more readily behind the car and so help them to prevent the formation of a vacuum, at high speeds, such as might tend to increase the dust raising. Forming the front of the bonnet is the honeycomb radiator, which is mounted on ball-socketed joints so that it has a certain freedom of movement and is not strained by any twisting of the frame. This ingenious system was, it will be remembered, a feature of the Spyker cars at the 1904 Paris Salon.

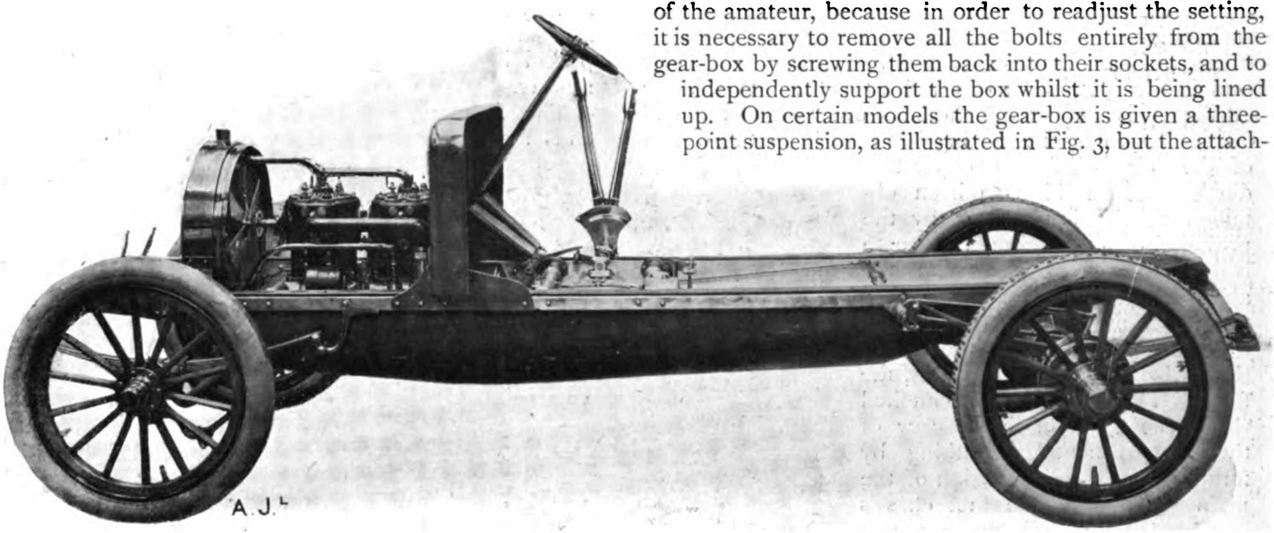


Fig. 2.—The 20-28-h.p. Spyker Car. Side view of the chassis showing the general appearance of the pressed frame.

This year, one of the most interesting novelties, apart from the frame, is the new type of pedal, or as it would appear on a finished car, the apparent absence of pedals altogether. Comfort has, considering its relative importance, generally received but grudging concessions from the designers of motor cars, and especially has this been so with regard to the size and positions of the pedals. By constructing them as part of the inclined floor-board they should at least be in a comfortable position, and a mere glance at our illustrations will show that, as regards size, they are everything that could be desired.

In the fly-wheel is a leather-faced cone-clutch of similar design to that used on previous models. It is of the external type, but has an enclosed spring which eliminates end thrust. By undoing the universal joint between the clutch and gear-box, the adjustment nut is ~~rendered~~ accessible. Close behind the clutch is the gear-box, which is supported in exactly the same way as the engine. It is a simple one piece casting forming a rectangular box, the only joints being the plate over the top casting and the caps over the ends of the shafts. When carried by a four-point suspension, the gear-box has four tubular brackets formed solid with it. Into these are screwed short steel bolts, A², which project from flanged sockets, A, attached to the frame. Having a thread formed on each end, these steel bolts are first screwed right home into the sockets, A, the gear-box is then set accurately in position. The bolts are afterwards screwed out of the sockets and into the brackets on the gear-box until they come hard up against collars formed on their shanks. This fixes them rigidly to the box, and lock-nuts are employed to make a rigid connection between the bolts and their steel sockets on the frame. Although this method of supporting the gear-box affords an easy means of alignment when fixing, it is yet sufficiently secure against the "good intentions" of the amateur, because in order to readjust the setting, it is necessary to remove all the bolts entirely from the gear-box by screwing them back into their sockets, and to independently support the box whilst it is being lined up. On certain models the gear-box is given a three-point suspension, as illustrated in Fig. 3, but the attachment to the frame is the same as that just described. An independent casting forms the "third point" bearing for the front end of the box, and this is rigidly attached to the frame by the two side sockets, A, and also by a third socket, A¹, fixed to the bottom of the frame.

The gear-shafts are carried on ball-bearings, and the gears are operated by means of a rack and quadrant, both of which are inside the box. The quadrant is arranged vertically, and the change-speed-lever is connected to it through an oil-tight bush which is well above the top of the gear-box. To facilitate inspection, there is a large circular hole in the top of the box, and this is closed by a plate which is merely held in position by a flat spring, and is thus instantly removable. Three

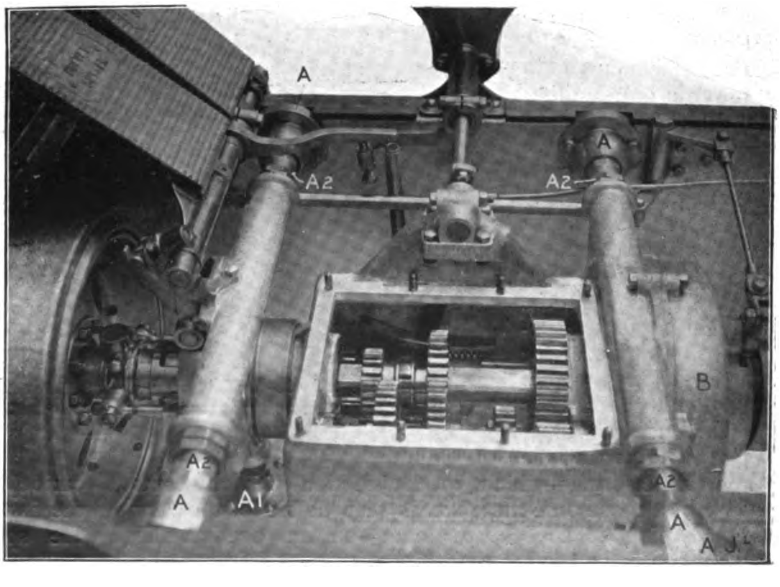


Fig. 3.—The 20-28-h.p. Spyker Car. View of the gear-box, showing the method of suspension and the operating quadrant inside the case. Behind the gear-box is an enclosed internal expanding brake, B.

speeds and a reverse are available from a single sliding member which carries two spur pinions. The direct-drive is obtained by engaging one of those pinions with an internally-toothed wheel, so that there is no jaw-clutch, as such—which shortens the length of the sliding member to a minimum.

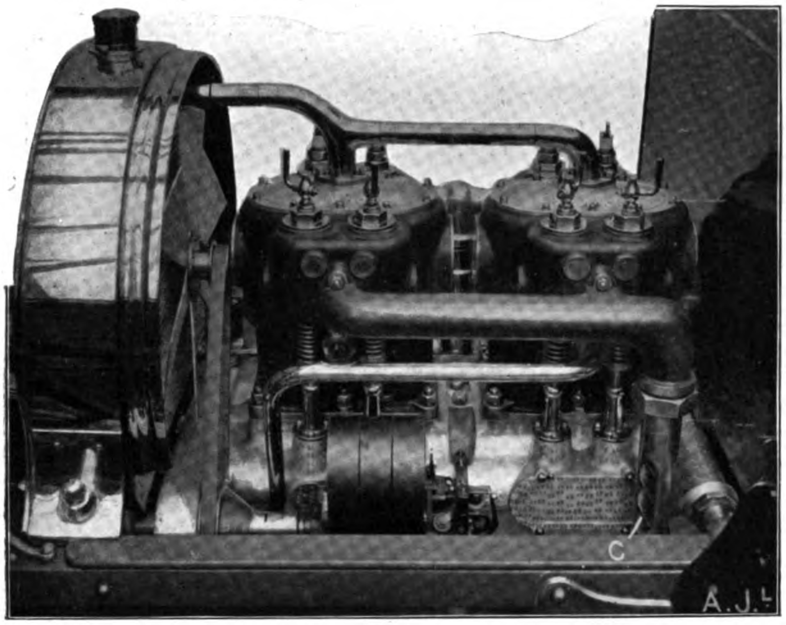


Fig. 4.—The 20-28-h.p. Spyker Car. View of the engine, showing the position of the high-tension magneto. In this view, which was taken from an exhibition model, part of the exhaust pipe is cut away to show the internal spiral passage, C.

Immediately behind the gear-box is the foot-brake, which is of the internal expanding type. It is entirely enclosed in a casing bolted to the gear-box, and this gives it a very clean appearance, which is typical of the Spyker design.

Owing to the proximity of the engine to the gear-box, the propeller-shaft is of considerable length. It has a universal joint at its front end, and is entirely enclosed in a substantial steel tube, which is bolted rigidly to the axle-casing at its rear end, and rides (on a ball-bearing) on the propeller-shaft itself in front. In this way it acts as a torque-rod, and counteracts the natural tendency for the axle-casing to revolve backwards. Although the back axle-casing is constructed in four parts, the Spyker Company have not yet adopted the horizontal division of the two central portions—which would allow a thorough inspection of the bevels without taking down the axle. The road wheels, however, are mounted on ball-bearings and run on tubular extensions of the axle-casing, and by so doing they relieve the internal shafts of anything but the torsional driving strain. Beneath the axle is a stay-rod for giving additional support to the central part of the casing surrounding the differential. Shackles being employed at both ends of the rear side-springs, some independent tie between the axle and the frame is necessary; this has been provided for by the short radius-rods which are attached, at their forward ends, to the same brackets as those which support the spring shackles. At their other ends they are attached to brackets which are fastened above the top leaves of the springs.

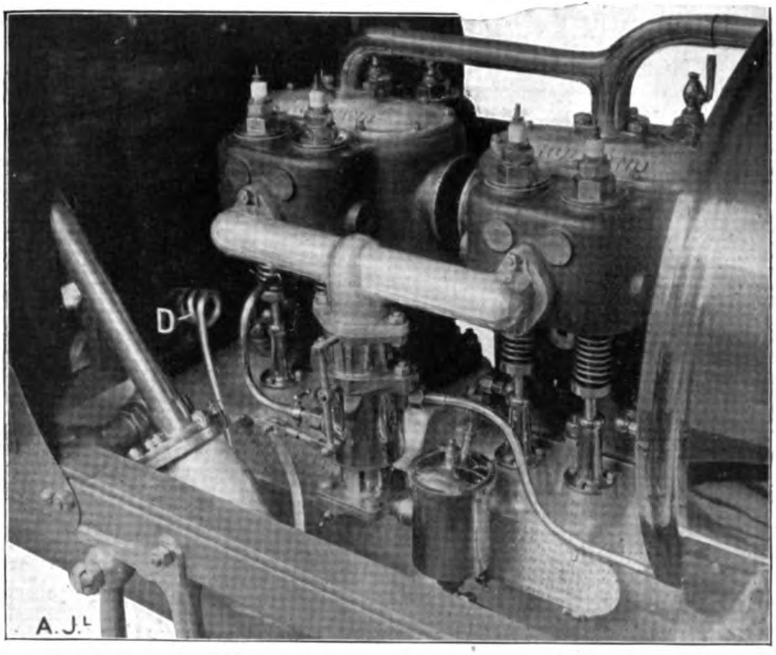


Fig. 5.—The 20-28-h.p. Spyker Car. View of the engine from the inlet-valve side showing the carburettor. Also prominent in this view is the coiled spring, D, used to support one side of the steering gear, the other side being hinged to the frame.

On the hub of each rear wheel are large internal-expanding brakes of the same pattern as that behind the gear-box. They are operated from a side lever, which is pulled backwards to apply them, and they are compensated by a steel cable in the orthodox way. An interesting point about the Spyker chassis is the construction of the wheels; they have fourteen spokes each, which is two more than is usual in standard practice, although some makers only fit ten.

For the next season the standard models are 12-18-h.p., 16-28-h.p., 20-24-h.p., and 25-38-h.p. Any of these, with the exception of the most powerful, can be supplied with the old type frame, if desired.

Bodies of the landaulette or side-entrance type are fitted to the standard chassis. One little fitting which has for some time past been used on Spyker cars is a luggage flap. It is formed by part of the panelling behind the rear seat, and is quite unnoticeable when not in use. Even when let down it is not large, but it is just sufficiently roomy to take a good-sized bag, and thus relieves the owner of the necessity of putting it in the tonneau—to the general inconvenience of everyone.

RESILIENT WHEELS.

(*Continued from page* 1436.)

THE HAWKSLEY PNEUMATIC WHEEL.

When writing the introductory chapter to this series of articles on Resilient Wheels, we referred, in general, to the occasional use of an internal pneumatic element in place of springs, and remarked in parenthesis that "It would not have been surprising to have found some resilient wheels using an internal arrangement of independent pneumatic cushions instead of springs, but we have not yet seen any spring wheel so constructed." This category is now represented, however, by the Hawksley wheel, in which the resilient element is supplied by four separate air-cushions symmetrically placed about—but not concentric with—the axle.

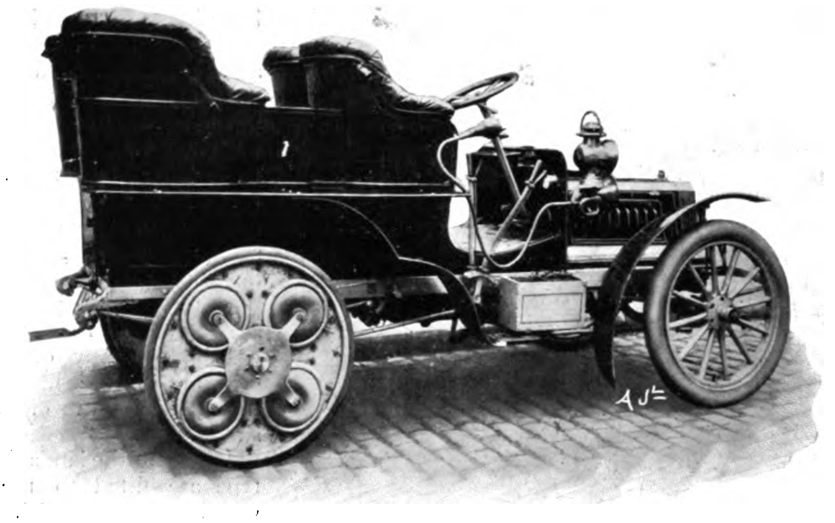


Fig. 1.—The Hawksley Wheel. View of a car fitted with a pair of these wheels.

So little is known about the theory of shock-absorbing devices in wheels that experimenters have to rely entirely on their own practical research to produce useful results. Thus most resilient wheels are, at present, quite as much the outcome of personal ideas as of scientific deductions from established data. There is little to guide the inventor of a pneumatic wheel; he may, for instance, fancy that the concentric arrangement of the pneumatic element is the secret of success or, on the other hand, he may not. Mr. Hawksley is of this latter opinion, but then the other side is not without supporters, as our articles on the subject have shown. There is one object, however, which Mr. Hawksley has had very prominently in view when constructing his wheel, and that is the acquisition of "softness," as distinct from mere "resiliency," in the running of the car. His idea has been, in fact, to imitate the effect of a partly-deflated pneumatic rather than the well pumped-up tyre, and, judging by some trials which we made recently, he has achieved this result to a far greater extent than might have been expected.

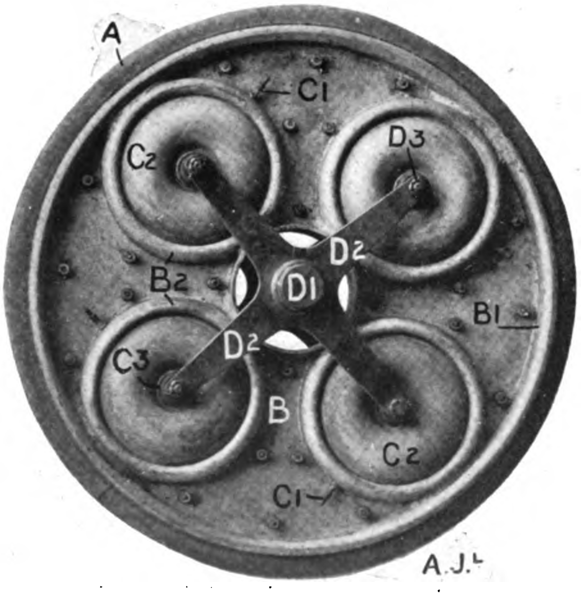


Fig. 2.—The Hawksley Wheel. View of the wheel complete, showing the four cushions and the driving arms in place.

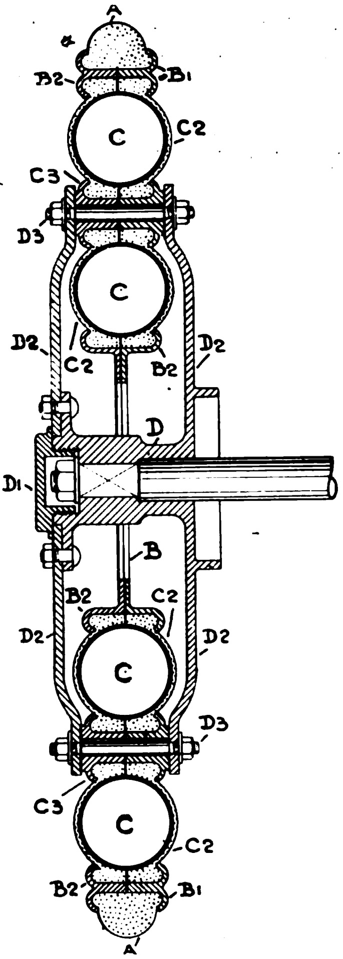


Fig. 3.—The Hawksley Wheel. Transverse section showing the arrangement of the various parts.

Our illustrations show very clearly the construction of the wheel and its component parts. The tyre, A, is mounted in the rim, A^1, which is formed by flanges on the peripheries of the two discs, B. Also carried by these discs are the four pneumatic cushions, each of which consists of an inner tube, or air chamber, C, and an outer cover, C^2, made in two parts. The halves of this outer cover are formed with beaded edges like an ordinary pneumatic tyre, and they are retained in place in much the same way. The cushions are, it will be noticed, annular in shape, and, through the holes in their centres, pass bolts, D^3, for the purpose of connecting them to the four-armed spiders, D^2, which are rigid with the hub, D. Small clamps, C^3, are used in order to secure the bolts, D^3, to the outer covers of the cushions.

All the weight on the wheel thus hangs directly on the fabric of the outer covers, and tends to pull the upper halves taut. By making these covers more or less concave, therefore, the range of motion between the two rigid members of the wheel can be varied to suit requirements. The air-chambers are only inflated to a pressure of about 20 lbs. per square inch for an ordinary touring car, and as a result the wheel, as a whole, is anything but stiff—especially in a lateral direction. This point is, in fact, one of the peculiarities of the Hawksley wheel, for the entire absence of rigid guides between the inner and outer members allows the wheel to slightly tip over obliquely to the axle whenever there is any tendency for it to do so. This is not, as a feature of construction, a point which would generally be considered favourable, but it does not appear to affect the control of the car, and it may even add to the softness of the action of the wheel. On this, also, is based a claim for reduced liability to side-slip, but we can offer no opinion at the present time on this matter.

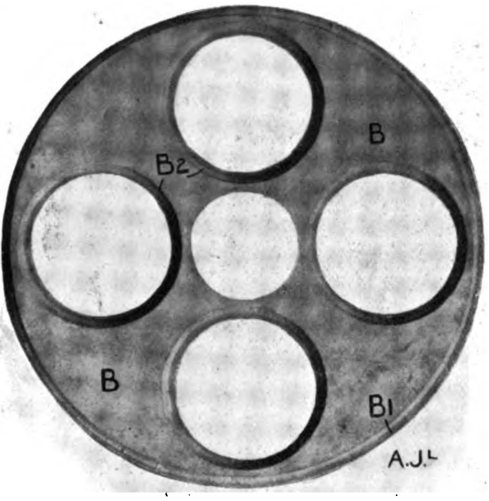


Fig. 4.—The Hawksley Wheel. View of one of the discs which carry the tyre and cushions.

Apart altogether from the shock-absorbing qualities of any wheel, there is, also, its practical durability to be considered. Obviously the outer covers of the cushions are called upon to withstand very severe strains, but knowing what the good pneumatic tyres of the present day will stand, there appears to be no reason why they should not be made to give satisfaction. At the present time we understand that the inventor has not experienced trouble in this respect, and it may be urged for these cushions that although they are probably subjected to more molecular friction, they are entirely removed from the rubbing action of the road, and as units they are inexpensive to replace.

In addition to their ordinary functions, the arrangement of the cushions in this wheel enables them to act, to a certain extent, as a "spring drive." Although not peculiar to resilient wheels as a whole, the use of the resilient medium for the purpose of neutralising the effects of a "fierce" clutch cannot but be considered as desirable in principle, especially for commercial vehicles, on which resilient wheels should find their widest field of usefulness.

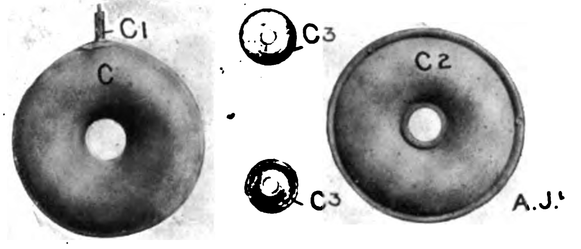


Fig. 5.—The Hawksley Wheel. View of one of the pneumatic cushions, C, together with one half of its outer cover, C^2, and the clamps, C^3, by which the driving arms are attached.

Table of Reference Letters for the Hawksley Wheel.

A	Tyre.	C^2	Outer covers.
B	Discs.	C^3	Clamps.
B^1	Rim for tyre.	D	Hub.
B^2	Rims for cushions	D^1	Hub cap.
C	Cushion air-chambers.	D^2	Driving arms.
C^1	Valves.	D^3	Driving bolts.

* * *

The Glamour of the Motor Car.

One does not like the sort of use to which the aureole of comparative respectability which surrounds the possessor, or alleged possessor, of a motor car, was put by the enterprising burglars who recently paid a visit to Miss Fox, of Hookwood, near Horley, who receives "paying guests." Seeing Miss Fox's advertisement, an adventurous "cracksman" of the name of Forsyth telegraphed that he was motoring to Horley and would call. He arrived on foot in the afternoon, and stated that his motor car had broken down at Redhill, and that he had come on by train, leaving the chauffeur with the car. He arranged with Miss Fox, and later in the afternoon introduced one Thomas, alleged to be his chauffeur. After dinner, Forsyth induced the lady to drink some whiskey, the naturally deleterious effects of which it is supposed he had increased by the addition of drugs, and she had to retire to her own apartments in consequence. In the meantime, Forsyth and Thomas decamped with articles valued at about £30, and some £4 10*s*. in money. Ultimately, however, they fell into the hands of Justice, through the suspicions of a country constable.

Hope for Veterinaries.

The veterinary surgeons who dined together at the Hotel Metropole, Leeds, recently, were rather pessimistic about the future of their profession, the motor car having made such inroads upon the business of the horse that they feared he would soon become extinct, and an important portion of the veterinary's business accordingly be lost to them. We would urge veterinaries generally, however, not to be too pessimistic, for the horse is not the only animal on whose ailments they have to depend, and if the numbers are diminished by the motor car, probably the horses who remain will be treated as pets, and then they will be ill nearly every day!

HIGH-TENSION MAGNETO IGNITION SYSTEMS.

(Continued from page 95.)

THE "CASTLE" SYSTEM—*continued.*

The Armature.

ALTHOUGH a laminated core is at present employed in the armatures of these machines, we understand that this will, in future, be abandoned in favour of a solid soft iron casting. Even now the side-plates, A^2, are each made in one piece, and are screwed directly to the end of the central core. In other respects the armature follows usual lines; the spindle is divided, and each half is screwed into a brass end plate by means of which it is attached to the armature-core. Ball-bearings, M^2, support the armature spindle at each end, and these are mounted on aluminium plates, M and M^1, which are screwed directly to the magnets. By simply removing four screws, and thus taking off the bearing-plate, M^1, the whole armature can be withdrawn; but a general inspection can be made even more readily by taking off the guard-plate above the armature, which is attached by four screws to the tops of the pole-pieces.

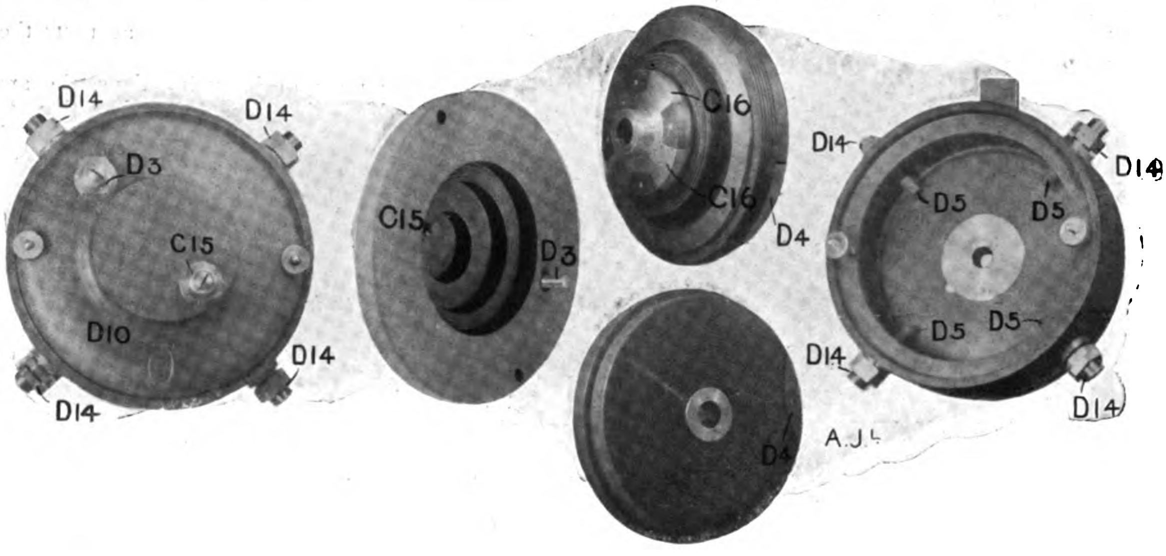


FIG. 4.—The Castle High-Tension Magneto System. View of the combined Distributor and Commutator, and of its component parts. The low-tension portion consists of the Brush, C^{15}, and the Contact Quadrants, C^{16}; the other brush, together with the Quadrant, D^4, belong to the High-Tension circuit.

For the purpose of attaching the driving-pinion, a separate tapered cone, B^2, is provided, and this is done on account of the timing gear which is introduced—on the spiral key principle—between the sleeve, B^2, and the spindle, B.

One end of the armature winding, C, is earthed to the core in the usual way, while the other passes through an insulating tube in the centre of the spindle, B, at the outer end of which it terminates in a hemispherical knob, C^1. Against this knob presses a samll spring contact, C^4, which is carried in the screw-cap, C^6, and the contact, C^4, is connected electrically to the terminal, C^{12}

The Coil and its Connections.

No low-tension gear as such being employed in this machine, the contact-maker, coil, and high-tension distributor are most suitably taken together as forming a combined unit. An illustration of the single coil appears in Fig. 1, while the multiple-coil is shown in

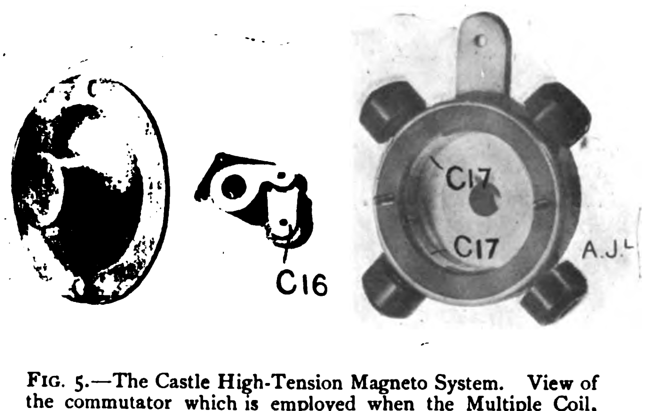


FIG. 5.—The Castle High-Tension Magneto System. View of the commutator which is employed when the Multiple Coil, shown in Fig. 6, is used instead of the single coil and high-tension distributor. This is of the ordinary roller contact type similar to those often used with ordinary battery ignition systems.

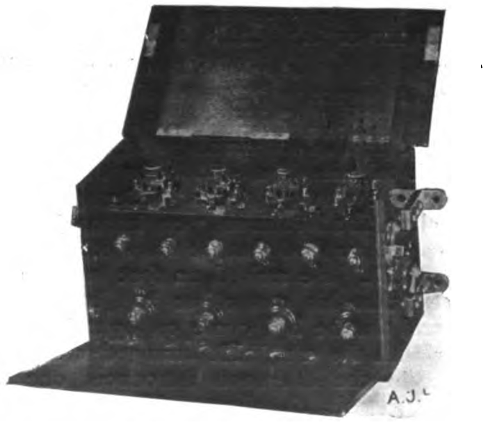


FIG. 6.—The Castle High-Tension Magneto System. View of a Multiple Coil for use with a four-cylinder engine, instead of the single coil and distributor, when this system is preferred.

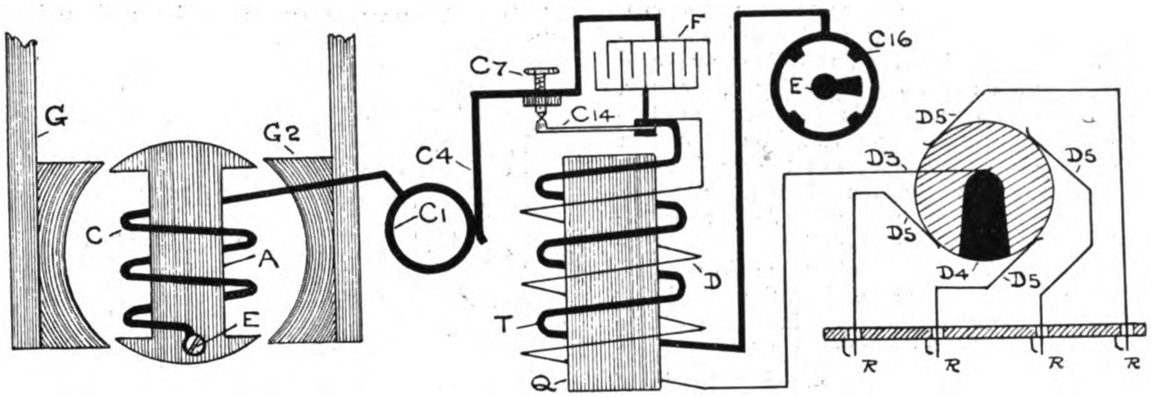


FIG. 7.—The Castle High-Tension Magneto System. Diagram of Internal Electrical Connections. It will be noticed that a trembler and contact-maker replace the usual form of positive contact-breaker generally fitted.

Fig. 5, but in either case they do not call for special comment, being similar in apppearance to the coils employed with ordinary battery-ignition systems. On the side of the box is the main switch for changing over from magneto to accumulators or *vice versâ.*

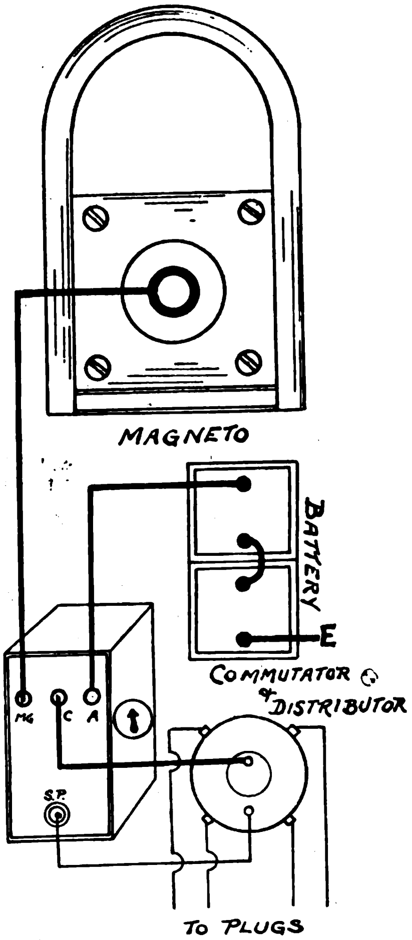


FIG. 8 —The Castle High-Tension Magneto System. Diagram of external connections showing how the magneto system should be installed when used in conjunction with ordinary accumulators. The main switch is on the side of the coil-box and the connections to it are permanent, being made internally. In this illustration, the letters against the terminals are those actually stamped on the case and do not apply to our table of reference letters.

When a multiple coil is used, the "commutator," illustrated in Fig. 6, is employed, but this is of familiar construction, and needs no special description. For use with the single coil, however, a very neat form of distributor, combined with low-tension contact-maker, is provided, this being illustrated separately in Fig. 4. From the terminal, C^{12}, on the magneto a wire is led to the terminal, C^{15}, on the outside of the case, and connected to this terminal, C^{15}, is a brush which presses against the rotating disc carrying the commutator segments, C^{16}. All these segments are, it will be noticed, connected to the centre boss which is fastened to the driving spindle, so that they make contact to "earth" and thus complete the primary circuit.

For the high-tension circuit a wire is connected to another terminal, D^3, also fixed to the cover, D^{10}, of the case. This terminal carries a brush, which presses against a brass ring connected to the distributor quadrant, D^4. As the distributor disc revolves, therefore, this quadrant, D^4, makes contact with each of the radial brushes, D^5, in turn, thus switching on the high-tension current to the ignition-plugs, which are connected to them by wires attached to the terminals, D^{14}. The condenser, F, is, of course, contained within the coil-box.

Timing the Ignition.

Although in any ignition system employing a trembler the time of ignition depends upon the setting of the contact-maker, yet when a trembler is used with a magneto it is desirable to ensure that some supplementary timing is provided for this also, in order that the arrival of the armature at its "maximum" position may coincide with the closing of the primary circuit by the commutator. In the Castle magneto this "timing" is obtained by the use of a spiral key between the driving-sleeve, B^2, and the armature-spindle, B. The key is connected to a rod, K^1, to which is attached a collar, K, for the purpose of engaging with the timing-lever. By moving the rod, K^1, in or out of the hollow spindle, B—which moves the key in its spiral slot, K^3—the setting of the armature relatively to the driving-sleeve, B^2, is altered and the "maximum" position is reached earlier or later in consequence.

The Electrical Connections.

There is nothing which demands special attention in the diagram of internal electrical connections shown in Fig. 7, with the exception, of course, of the trembler and "commutator," instead of the ordinary contact-breaker.

In Fig. 7 the circuit for the magneto only is shown, which is in accordance with our usual practice in connection with these particular diagrams. The actual connections for both circuits are given in Fig. 8, however, and from this diagram the combined magneto and battery ignition could be correctly installed on a car. In this view, too, the small letters against the terminals on the coil-box are those actually stamped on the case, and do not in any way correspond to our table of reference letters, which apply to all the other illustrations. The coil-box has, it will be noticed, three low-tension terminals and one high-tension terminal, the latter being connected to the distributor. On the side of the battery-box is the switch, but as the connections to it are permanently made inside, they need not trouble the motorist. The "earth" connections are, of course, made in the usual way to the frame of the chassis.

Table of Reference Letters for the Castle High-Tension Magneto System.

A	Armature core.
A^2	Side plates.
B	Armature spindle (driving end).
B^1	Armature spindle (free end).
B^2	Engine-driven sleeve.
B^5	Armature end plates.
C	Armature coil.
C^1	Contact knob.
C^4	Collector contact.
C^6	Holder for C^4.
C^7	Adjustment screw.
C^9	L.-T. distributor feeder brush.
C^{10}	Distributor segment.
C^{11}	Distributor brushes.
C^{12}	Magneto terminal.
C^{14}	Trembler blade.
C^{15}	Brush of contact-maker.
C^{16}	Contact-maker quadrants.
D	Secondary winding.
D^1	Secondary winding (live end).
D^3	Feeder brush.
D^4	Distributor segment.
D^5	Distributor brushes.
D^{10}	Cap for distributor box.
D^{14}	Terminals to plugs.
E	Earth.
F	Condenser.
G	Magnets.
G^1	Base-plate.
G^2	Pole-pieces.
K	Collar for timing-lever.
K^1	Sliding-rod for K.
K^3	Spiral slot.
L	Lubricators.
M	Bearing plate (driving end).
M^1	Bearing plate (free end).
M^2	Armature bearing.
R	Ignition plugs.
T	Primary winding of coil.

* * *

THE AUSTIN PETROL CARS.

A VERY complete catalogue giving detailed specifications of the cars which are being manufactured by the Austin Motor Company has now been issued, and can be obtained by all those who are likely to be interested in these new cars. As already announced by us, they comprise three distinct models, for the 25–30-h.p. car is either of the live-axle-type or is fitted with side-chains as may be required, and there is, too, the 15–20-h.p. live-axle vehicle. From the further particulars now available, it is evident that Mr. Austin has followed the most up-to-date practice in automobile construction and has embodied all such special features as are most appreciated by the public in cars of thoroughly orthodox design.

Thus, for instance, the engines have four separate vertical cylinders, with interchangeable inlet and exhaust valves, with five bearings to the crank-shaft, with an independent base-casting to the crank-chamber, and with easily removable cam-shafts; the main-clutch is of the multiple-disc type with metal to metal friction surfaces running in oil; the change-speed gear is constructed on "Mercedes" lines, with ball-bearings, with the sliding portion of the operating mechanism enclosed inside the gear-box, and with four forward speeds; and the pressed-steel frame is narrowed in front, is raised at the rear to clear the axle, and has its side-members formed in one piece with the under-frame carrying the engine and gear-box. Additional features are, moreover, numerous. Each shaft in the gear-box has three bearings, the box itself has no joint that can leak; the live-axles are connected with the main-frame by a torque-rod as well as by radius-rods, the "live" shafts inside the axles take none of the weight of the car, and all the road-wheels, as well as the easily-adjusted steering-gear and the steering-heads, have ball-bearings.

In connection with the engines, special care has been taken to enable absolute synchronism to be maintained at all times, for not only is the valve-gear (and the ignition-gear for the low-tension igniters) adjustable, but the lift of the valves, and the firing moment of each igniter, can be adjusted while the engine is running. A circulating pump constantly lubricates all the moving parts except the pistons, and these are fed with oil separately from a fitting on the dashboard. For maintaining any desired speed, a sensitive automatic governor is mounted on the spindle of the belt-driven fan, and this governor is connected up with the throttle-valve, with an accelerator-pedal, and with one of the small hand-levers above the steering-wheel.

Both engines run at a normal speed of 900 revs. per min., and both have a stroke of 5 ins. The smaller model, with its 4⅛-in. cylinders, develops 22-b.h.p. at that speed, and the larger engine, with its 4½-in. cylinders, gives 32-b.h.p. All the standard cars have a wheel-base of 9 ft. 9 ins., with a track of 4 ft. 7 ins., but the 15–20-h.p. vehicles have 12-gall. petrol tanks, as against 15-gall. tanks on the 25–30-h.p. models, and their tyres are 880 mm. by 120 mm. and 870 mm. by 90 mm., as against 920 mm. by 120 mm. and 910 mm. by 100 mm. On the chain-driven car, the differential-countershaft is contained inside a separate casing, which is quite distinct from, and is some distance behind, the gear-box.

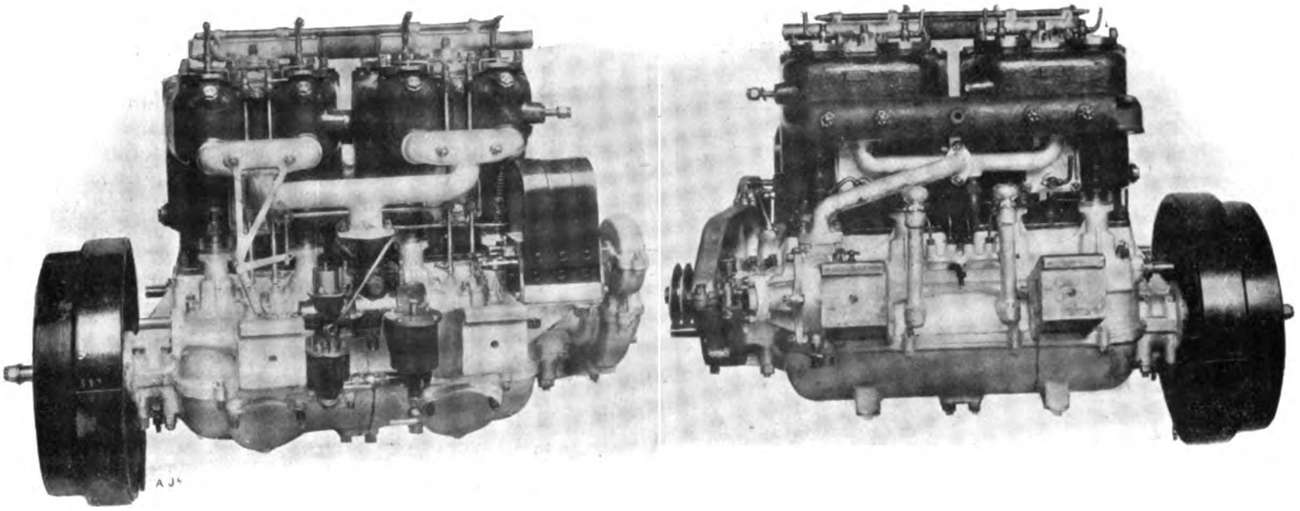
* * *

Brighton Motor Road "Finance."

THE Bill for legalising the egregious London-Brighton motor road project is incurring pronounced opposition, even at this early stage of the proceedings. In addition to the objections to it chronicled by us last week, it has further been opposed by Lord Hylton and Mr. Richard Trower on the ground of not complying with the Standing Orders, and was further objected to by Parliamentary agents appearing for the opposition on the ground that the prospects of the scheme were so problematical as to render any examination unnecessary. The most serious objection of all, however, was that the necessary deposit money, which in accordance with the Standing Orders must be found before the examination of the Bill, had not been obtained, and it is reported that the promoters of the project are still running round the City endeavouring to obtain the money—a condition of affairs which caused one of the representatives of the objectors to protest that if the application for an adjournment for a week were granted, it would be used by the promoters solely for the purpose of endeavouring to obtain money that ought to have already been subscribed. That the prospects of obtaining it after this publicity are therefore not very rosy, goes without saying, and the *Financial Times* comments on the failure to produce the required deposit, as follows:—

> "This is not surprising, in view of the suggested particulars in regard to this absurd promotion which we placed before our readers on the 4th."

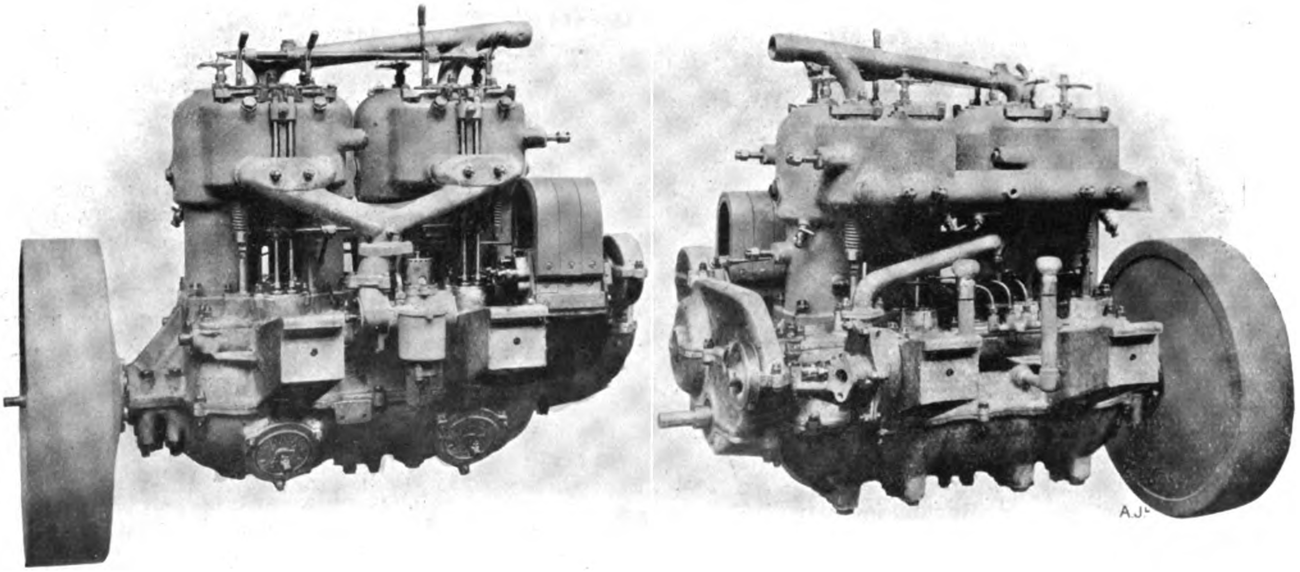
THIS YEAR'S 30-H.P. AND 40-H.P. CROSSLEY ENGINES.



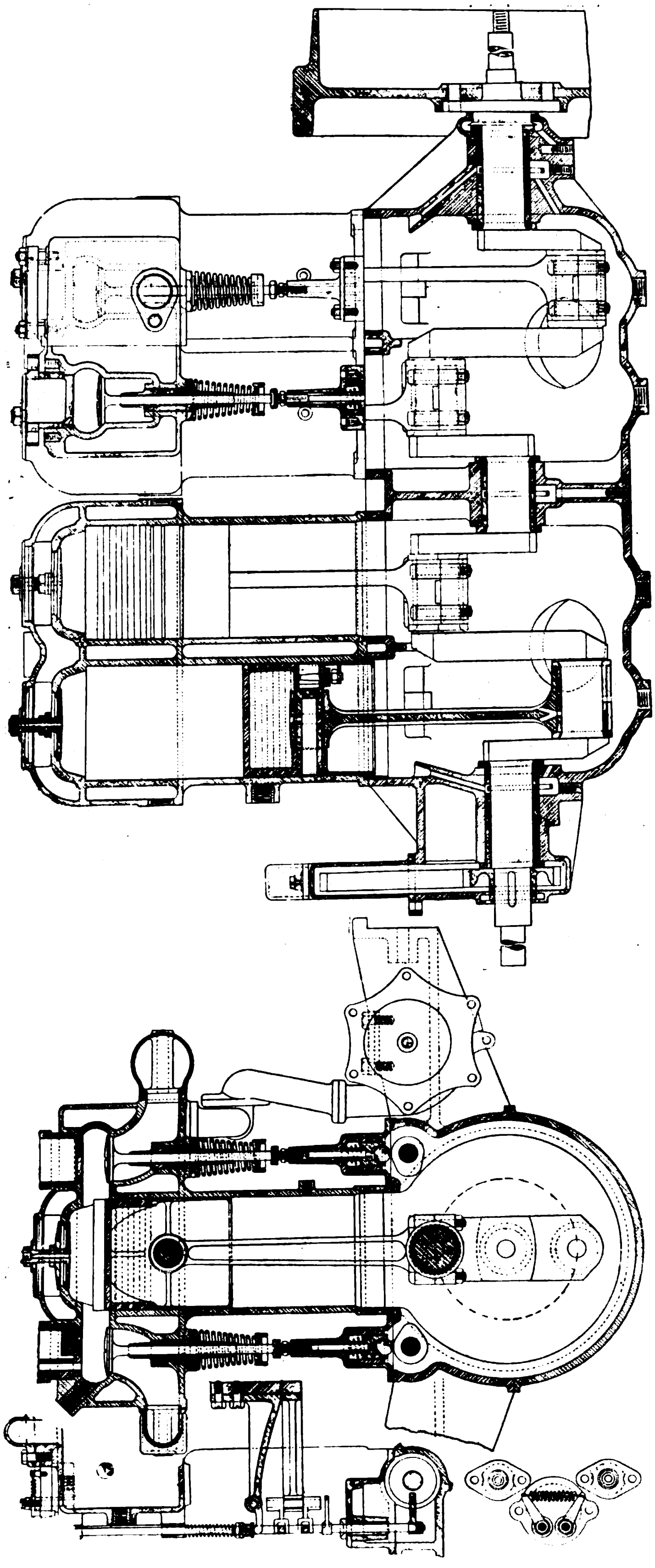
Figs. 1 and 2.—The 30-h.p. Crossley Engine. Views from each side, with the carburettor, magneto, and circulating-pump fixed in place. The cylinders have a bore and stroke of $4\frac{5}{16}$ in. and $5\frac{1}{8}$ in., respectively, and the normal speed is 900 revs. per min.

ON November 4th last, an illustrated description was given in these columns of the improved chassis that has been adopted for the 1906 Crossley cars. At that time, however, no photographs of the new 40-h.p. engine were available and we were consequently unable to deal with it in any detail. Similarly, the previous week, we had to content ourselves with briefly mentioning the chief respects in which the earlier 22–28-h.p. engine (now 30-h.p.) had undergone modification, and had no illustrations with which to show its present appearance. Our readers will consequently welcome the photographs and drawings which are now reproduced, for these include two views of each engine—the present 30-h.p. and the new 40-h.p.—as well as two sectional drawings of the more powerful model.

In a general way, both engines resemble that originally introduced by the celebrated Crossley firm early in 1904, at which time (on February 13th) we published very full particulars concerning its design and construction, but the well-known designer, Mr. J. S. Critchley, has since then added improvement after improvement in matters of detail, with the result that the latest models are even more efficient, noiseless, and flexible than before. The cylinders of the 30-h.p. engine, which is shown in Figs. 1 and 2, are now bored out to $4\frac{5}{16}$ ins., but the stroke ($5\frac{1}{8}$ ins.) remains the same. Its reciprocating parts have been reduced in weight, in order to enable it to run faster, and several other alterations have been made with a similar object in view.



Figs. 3 and 4.—Two views of the new 40-h.p. Crossley Engine, which—in spite of its greater power—occupies the same space as the 30-h.p. model. The bore of the cylinders is $4\frac{3}{4}$ ins., the stroke is 6 in., the normal speed being 900 revs. per min. An improved form of carburettor is used, in which the fuel, as well as the air, is automatically controlled by the suction of the engine.



Figs. 5 and 6.—Sectional Drawings—transverse and longitudinal sections—of the 40-h.p. Crossley Engine, showing the internal construction and arrangements of the various parts. On the left, in Fig. 5, is a separate drawing of the ignition-gear, with its disc cam, for one cylinder.

A comparison of Figs. 3 and 4 with Figs. 1 and 2 will show the differences that there are in the design of the 40-h.p. engine, the most striking of these being the relatively small size of the new model, in spite of its larger cylinder dimensions. The 40-h.p. engine has 4¾-in. pistons, the stroke of which is 6 ins., and yet it fits into the same chassis as the smaller engine, for the cylinders themselves are not only closer together, but the valves are brought in much nearer to the centre.

Other points are that the water-jackets do not extend so far down from the cylinder-heads as they do on the 30-h.p. engine, that a modified form of carburettor, having an automatic adjustment for the petrol-jet as well as for the auxiliary-air, has been adopted, that a neater form of crank-chamber has been employed, and that the induction-pipe affords a more direct passage for the explosive mixture.

These photographs, taken in conjunction with the sectional drawings given in Figs. 5 and 6, show the construction and arrangement of every part, and it is therefore quite unnecessary for us to enter into any lengthy description concerning them. It may, however, be useful if we draw attention to a few of the characteristic features of both engines. Thus, for instance, it will be noticed that the spur-wheel driving the low-tension magneto, on one side, and that driving the centrifugal pump, on the other side, are enclosed in the same oil-tight casing as the three wheels by which the cam-shafts are connected with the crank-shaft. Further, it will be noticed that the low-tension igniters form inspection-plugs above the inlet-valves, that an automatic governor acts upon a butterfly-valve in the induction-pipe to prevent "racing," and that provision is made for "timing" them by sliding the vertical rock-shafts up and down; these igniters are actuated by disc-cams on the cam-shaft, and, as is the case with all the valve-gear, great care has been taken to facilitate accurate adjustment and ready accessibility. Another point, which might escape notice, is that high-tension ignition-plugs can be fitted if required, the screw-sockets for these passing diagonally into the inlet-valve-chambers.

The 40-h.p. engine, in particular, is remarkably well designed throughout, and has ample wearing surfaces for all the various bearings. It develops 35 b.h.p. at a speed of 800 revs. per min. or about 42 b.h.p. at 1,000 revs. per min. Both engines are, in fact, well worthy of the celebrated Crossley firm, and are admirably calculated to maintain the world-wide reputation they have earned with their other and heavier types of gas engines.

THE CRITCHLEY LOW-TENSION IGNITION GEAR.

Although not actually fitted at present to the Crossley engines, of which a description has just been given above, the accompanying drawings show a new form of ignition gear applied to an engine of similar type, this device being one of Mr. J. S. Critchley's latest inventions. Its chief object is to simplify the mechanism by which the low-tension igniters are actuated from the cam-shaft, and to operate the four igniters on a 4-cylinder engine by two cams instead of four. But it also has the effect of rendering the usual valve-gear much more accessible, since the whole of the ignition mechanism is arranged above the cylinder heads. Fig. 1 is a plan view of an engine in which the igniters, A, are placed immediately over the inlet-valves (in precisely the same way as on the 40-h.p. Crossley engine), and the exhaust-valves lie above another main cam-shaft on the opposite side. Both cam-shafts are indicated in Fig. 2, which is an end elevation of the upper portion of the engine with the ignition mechanism shown sectionally. From these drawings it will be noticed that a vertical shaft, B, is led up, inside an oil-tight casing, from above the inlet valve cam-shaft, between the two cylinder-castings, and that this vertical shaft is driven by bevel-gear, B³, from the horizontal shaft. At the top of the shaft, B, are the two ignition-cams, B¹ and B², the former being immediately above the latter; the cam, B¹, actuates the igniters of the two inner cylinders, and the cam, B², operates the the two outer igniters.

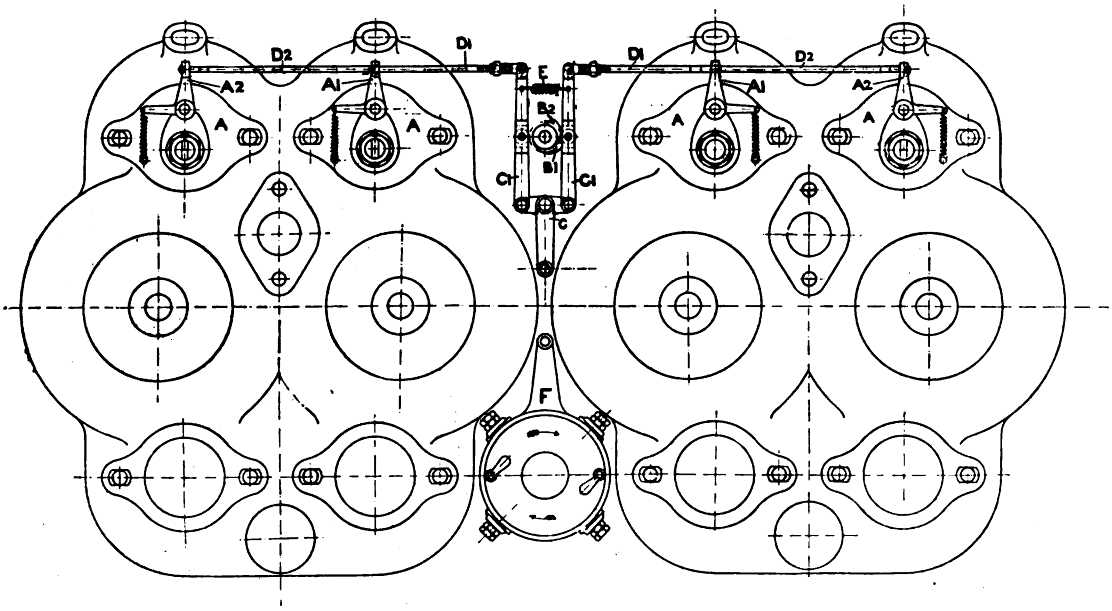


Fig. 1.—Plan of a 4-cylinder petrol engine, fitted with the new Critchley ignition-gear. All four igniters are operated by two cams mounted upon an enclosed vertical shaft.

For this purpose, as also for "timing" the ignition, a pivoted lever, C, is mounted about a stationary pin at the top of the casing, and to each arm of this lever are hinged a pair of links, C¹ and C². These links, C¹ and C², carry small rollers that engage with the cams, B¹ and B², respectively, so that the upper cam tends to force the links, C¹, outward as it revolves, and the lower cam has the same effect on the links, C². A further point that should be noticed is, that when the pivoted lever, C, is rocked about its axis, the moments at which the cams come into operation are rendered either earlier or later for all four of the links. The two upper links, C¹, are normally held against the cam, B¹, by the spring, E, and there is a similar spring introduced between the lower links, C², these springs tending to give a very quick throw-off action as the rollers slip off the sharp edges of the cams. Each of the igniters has its own spring for bringing the contact-points together, but it is the much stronger springs, E, that strike them apart, for the two links, C¹, are connected with the rocker-arms, A¹, of the igniters on cylinders Nos. 2 and 3, while the lower links, C², are similarly connected with the other

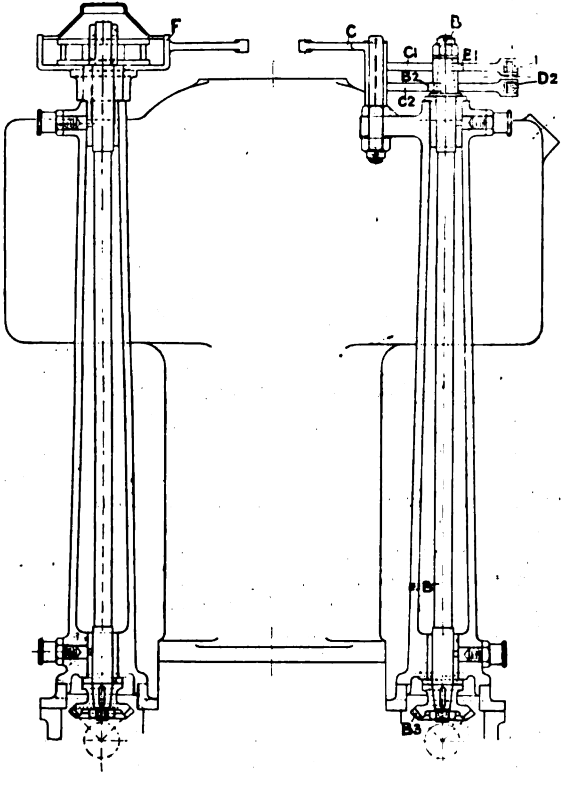


Fig. 2.—End elevation, with the ignition-gear in section, showing the Critchley low-tension operating-mechanism fitted to a 4-cylinder petrol engine.

rocker-arms, A^2, by rods, D^1 and D^2, respectively. Such is the shape of the rods, D^1 and D^2, that they merely allow the igniter-springs to bring the contact-pieces together, when the cams, B^1 and B^2, relieve the rods from the pressure of the springs, E, but the ends of the rods engage with the rocker-arms, A^1 and A^2, when making their quick-return stroke. In our drawings of this particularly neat mechanism, the engine is also shown with a similarly arranged shaft above the exhaust-cam-shaft for carrying the commutator, F, but this is, of course, only needed if an auxiliary, high-tension, battery system is employed as well.

* * *

THE CRYSTAL PALACE SHOW.

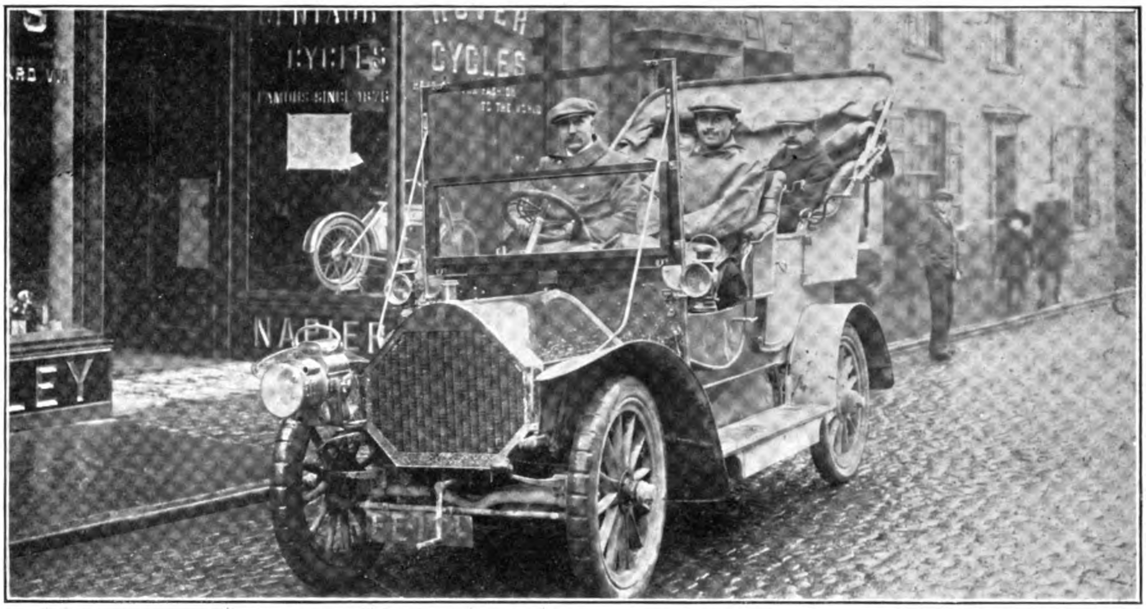
The Fifth Annual Automobile Exhibition at the Crystal Palace opened on Friday, the 26th ult., and closes to-day (Saturday). No one can have expected the Show to be remarkable, either for the completeness or the novelty of its exhibits, and while it does not altogether belie these anticipations, yet there seemed this year to be a stronger breath of life about the place than was the case last year. It is a small collection of cars—very small when compared to the glories of the past—and yet a man might do far worse than go there to buy, for there are several first-class machines in evidence, and there is not that confusion caused by mere multitude which must often have proved a disappointment to some would-be purchasers of good cars. There are several interesting exhibits which nevertheless are not fresh, but there are also others which have not previously been on view.

Humber Cars.—On the Humber Stall, for instance, is a new 16–20-h.p. chassis which has just been introduced for the next season. It is built on similar lines to the previous live-axle model, but embodies several important modifications in detail. As at present constructed, it has a pressed-steel main frame, and an angle-iron under frame for the engine and gear-box. Each cylinder of the engine is cast separately, and the power is transmitted through a leather-faced cone-clutch, which can be easily dismounted after disconnecting the universal joint between it and the gear-box. No less than nine ball-bearings are employed to support the gear-shafts, there being a double-row bearing at each end and an intermediate single bearing on the through-shaft. Two universal joints are fitted to the propeller shaft, and there is a horizontal joint between the two central members of the back-axle casing. Tubular extensions of this casing support the road-wheels and hinged radius rods transmit the drive to the frame; the torque is counteracted by an independent triangular stay. Altogether the Humber cars are, at the present day, among the most notable on the market, and they should establish a sound reputation for the firm which is using its utmost endeavours to supply a sound car at a low price. On the stall, too, are displayed the parts of the 10–12-h.p. Humber car driven by Mr. R. M. Wright on the 5,000 miles trial. Particulars relating to this run appear elsewhere, but it may again be mentioned that the various parts are all in good condition after their test, some slight signs of insufficient oil on a connecting-rod big end, and the results of a little hurried gear changing being all that is at all noticeable.

Vinot Cars.—Among motor vehicles which have sprung quickly into prominence and into no little popularity as well is the Vinot car. It is but a short time since T. J. Harman and Co. introduced them into this country, but from the first they gained favour, and to-day they take a high position among cars of their class. No doubt the excellent performance of their Tourist Trophy car was not a little responsible for this, but there has always been evidence of good workmanship and no little ingenuity on the part of the manufacturers. One of the most peculiar features about this car is, as our readers are aware, the change-speed lever, which operates a gear-box of the divided sleeve, or "Mercedes," type without the use of a sliding lever — which fact is naturally of additional interest at the present moment when the situation with regard to the so-called "gate" system is beginning to get interesting from the patent point of view. Another feature of the chassis is the self-aligning clutch, and in connection with this an improvement has now been introduced by which the clutch-cone is prevented from tilting out of truth when released from contact with the outer member. This is accomplished by the simple expedient of fitting a collar on the clutch-shaft immediately behind the inner member; when, therefore, the clutch is disengaged, the cone is forced backwards against this stop which keeps it in proper alignment so long as the clutch is free.

Pilain Cars.—Although the Pilain cars have been exhibited in England previously, the 40–60-h.p. model has hitherto only been shown in Paris. It differs entirely from the other models, but the prevailing idea of having a direct-drive on more speeds than one is, of course, characteristic of it also. In this car there are three speeds and a reverse, and every one is a direct-drive. On the end of the propeller-shaft are three bevel-pinions which mesh respectively with three bevel-wheels, of varying diameter, riding on the back axle. Either of these wheels can be locked to the shaft by means of sliding keys operated from a side-lever in the usual way. A differential-gear is introduced between the bevel-wheels and the axle proper, and the reverse is obtained by a fourth bevel-wheel placed on the opposite side and meshing with the "low-speed" pinion. Three-quarter elliptic springs support the frame at the rear, and the propeller-shaft casing, which terminates at its upper end in a large ball-socket bracket attached to a cross-member of the frame, takes the place of any radius or torque-rods.

Darracq Cars.—On the Darracq Stall is one of the new 20–32-h.p. chassis, which embodies the latest modifications of this enterprising firm. The new engine has an extremely neat appearance—especially on the show chassis, where it is finished off with an oxydised surface. All the valves are on one side, and the leading characteristic of the design has been to make the cam-shaft which operates them as useful as possible. For this reason the igniters are also on the same side, but, as usual, it has not been found convenient to operate them absolutely direct from the cam-shaft. A very neat arrangement has been adopted, however, the small rock-levers which are interposed between the lower ends of the tappet-rods and the cam-shaft, to get over the difficulty, being enclosed in small brass covers, which are quite in keeping with the general cleanness of design.



5,000 MILES RELIABILITY TRIAL.—Mr. R. M. Wright and his 10–12-h.p. Humber Car, with which he has just completed a 5,000 miles reliability run, finishing at the Crystal Palace at midday on Saturday last. We give particulars of Mr. Wright's performance on page 142. Except for the replacement of a commutator ring, no troubles were experienced, and, in spite of exceeding bad roads, only five punctures occurred, the Dunlop tyres equalling the good behaviour of the British-built car itself.

Mounted in front, on a transverse-shaft, which is skew-gear driven from the cam-shaft, are the low-tension magneto and the gear-wheel circulating pump. It is one advantage of using skew-gearing, that the driving and driven shafts can cross one another, and this fact has been taken advantage of on the Darracq car by carrying the cam-shaft out beneath the radiator and mounting on its projecting end the commutator for the high-tension ignition system. There being still the other end of this ubiquitous cam-shaft unemployed, the designers have saddled it with the work of driving a neat little centrifugal oil-pump which supplies the lubricant to the sight-feed fitting on the dash. Incidentally it may be mentioned that the mechanism for timing the low-tension igniters is also operated through the cam-shaft.

In the fly-wheel is the usual cone-clutch, but this, in the present model, has springs placed under the leather to render it less fierce. Close behind the clutch is the gear-box, and a long propeller-shaft transmits the power to the live-rear-axle. One universal joint is provided in the propeller-shaft at its upper end and there is a flexible box-coupling near the back axle. The rear wheels run on tubular extensions of the axle casing. A peculiarity about the frame is that, at the rear, the side members are not only bent upwards over the axle but inwards also, this latter being for the special attachment of the body.

Rochet-Schneider Cars.—Another new model of considerable interest is the live-axle Rochet-Schneider. It has an 18–22-h.p. 4-cylinder engine which, in general design, does not differ from the previous models; the method of control has been changed, however, and instead of the long levers projecting from the dash, the manufacturers have adopted the less striking, but more accessible, system of placing them above the wheel. Quite a new design of gear-box, too, has been introduced on this model. It appears exceedingly small, because the lay-shaft is placed beneath instead of to one side of the through-shaft. A transverse semi-elliptic spring is used in conjunction with the ordinary side-springs to support the rear of the chassis, but a noticeable feature about all these springs is that they are much smaller and have a greater camber than those usually employed on cars of this type.

Itala Cars.—No stand in the Palace is more artistic, and on none are the exhibits more interesting, than that of the Fabry Automobile Company. On it is the Itala 100-h.p. racing car which won the Florio Cup, but of more direct interest to would-be purchasers is the latest touring chassis. This is one of the typical first-class Italian machines, but is in the minority as a type among them by reason of its live-axle—for most Italian cars are chain-driven. Clean design is a characteristic of the chassis as a whole, but there are several small details of especial interest. It has a 4-cylinder engine, on which are an igniter mechanism of peculiar construction, a disc clutch and a four-speed gear-box of the Mercedes type. Both in front and behind the gear-box is a shoe brake, each being operated independently by pedals, and the latter being automatically water-cooled when in action.

Fiat Cars.—Another Italian car represented at the show is the Fiat, but the details of these famous vehicles are so well known to our readers through the special descriptive articles which have appeared on them from time to time (the latest models were described on July 22nd, 1905), that further reference to them now would be superfluous.

Spyker Cars.—Similarly with the new Spyker Car, exhibited by the British Automobile Commerical Syndicate, no mention is needed here because the features of this most interesting "dustless" chassis are described at length elsewhere.

Car Bodies.—Although of secondary importance to the chassis, the body of a car is oftentimes the first consideration of a buyer, and there is no doubt that it is the realisation of this fact which has led to the evolution of such luxurious and convenient carriages as are now standard attributes to every well-appointed stand at an Exhibition. Two such vehicles on the Vinot stall are of special interest. One is a double phaeton, the other a landaulette. Apart from the elaborate completeness of the fittings of the phaeton, it was, as a specimen of body-building, remarkable for the number of different "conversions" of which it is capable. Normally a cosy enclosed carriage, it can easily be changed into an airy limousine by the hinging up of the front window and the removal of the top halves of the carriage doors and sides. In addition to this, however, the entire top is removable so that the car becomes a simple, side-entrance, touring vehicle. Another feature of this car is the arrangement of two folding chairs, which normally lie flat against the back of the front seat. In an instant they can be brought into use, however, and when in position they can be so adjusted that they permit the occupants to face either direction with equal comfort.

On the Vinot landaulette it is the entrance which is remarkable. No seat is provided besides the driver—which offers an admirable excuse for the absence of a footman—the space thus obtained being utilised for the door giving access to the carriage. It is a simple manner of obtaining a really adequate side entrance with a short chassis, and at the same time it detracts nothing from the smart appearance of the vehicle. Its only drawback is that it does not enable the carriage to be entered from the "off" side also.

Motorists who are accustomed to carry their own luggage with them in the tonneau—to the general discomfiture of travellers and kit—will appreciate the simple device which has for some time been a feature of the Spyker cars. It is merely a hinged shelf, formed by part of the panelling at the rear of the car, which can be let down when required. Although not large it will take an ordinary portmanteau, and when not in use it takes up no room nor does it detract from the appearance of the car.

Commercial Vehicles.—Almost the only exhibit of heavy vehicles were those shown by the Thames Engineering Company. On this stall were two petrol-driven chassis and one steam vehicle. The larger petrol chassis is for loads up to 4½ tons and has a 24-30-h.p. engine. One of the characteristic features in the design is the separation of the differential casing from the gear-box. This differential countershaft casing is supported direct by two transverse members of the frame which are specially placed to receive it. Side chains transmit the power to the road-wheels and the gear-box gives three speeds and a reverse. A very large cone-clutch is accommodated in the fly-wheel, and between the gear-box and the differential is a very large shoe-brake. Altogether the chassis has the appearance of being a soundly made machine. Similar general lines have been adopted for the smaller model which is designed for van work with loads up to 1 ton. This, however, has a 2-cylinder engine.

Motor Boats.—One of the principal features at the Palace this year is the motor boat section, and the large lake in the grounds has been requisitioned for the purpose of giving trial runs. There are a fair number of firms in evidence, but nothing of great novelty. Among the most interesting exhibits is that of the Saunders Launch Syndicate, who have tackled the motor boat question with serious earnestness since the beginning. Mr. Saunders' latest idea is the provision of further security against possible leakage of petrol. A strongly brazed tank is carried either fore or aft in the usual way, and a flanged pipe is carried from the tank to the surface of the turtle deck above it. Bolted to this is a special fitting which provides the necessary connections for feed and pressure pipes, indicator gauge and relief cock. Any leakage which occurs at this point must flow overboard, and the only other danger point is the carburettor. There is, of course, nothing very special about the fitting, but it is the carrying out of a common-sense plan of concentrating all the probable sources of leakage at one point, and placing that one point in a relatively safe place.

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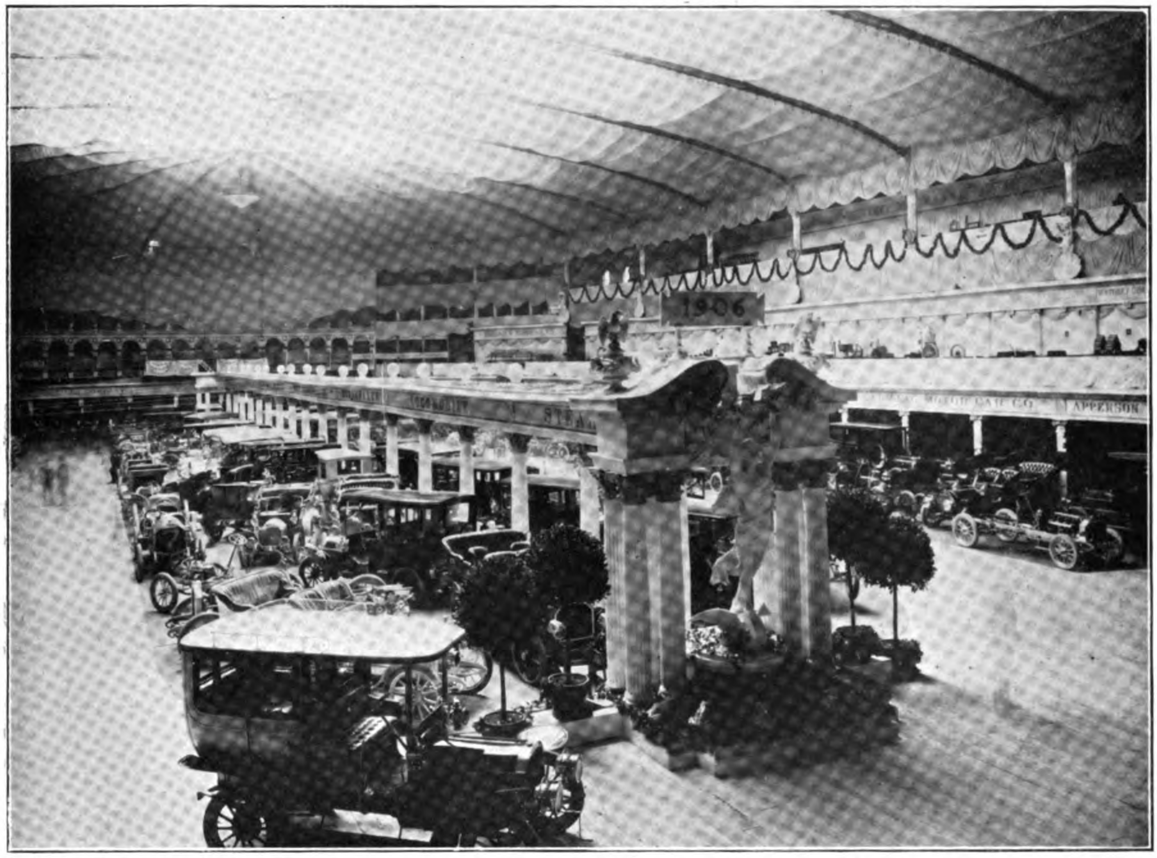
THE EDINBURGH SHOW.

A SHOW which opens its doors for the ninth year in succession—each succeeding year's display being a greater success than that which preceded it—can claim to be a fairly well-established institution, and such is the case with the Edinburgh Motor and Cycle Exhibition, held in the Waverley Market, from the 26th January till to-day (Saturday, the 3rd February). There has, however, been something of a change in the character of the show during the passing years, for whereas in its early days it was the Edinburgh Cycle and Motor Exhibition, with a vast display of cycles and a very limited number of motor machines, it is now a motor and cycle show with the cycles generally occupying the small stands under the gallery, keeping the accessories in countenance. A few of the makes of cycles, such as the Sunbeam, Singer and Rover were in the open, but most of the floor area was occupied by cars. Of the latter there was a large variety of both make and quality, and from the man with a Crœsus-like purse to the man of moderate means there was a range of makes and prices suitable for all. There were in all about 120 cars shown, of which from 80 to 90 were of British make. Naturally, the car most largely represented was the Argyll, of which there were 14 located on various stands. Albion came next with 10, Wolseleys 9, Arrol-Johnstons, Swifts and Napiers 5 each, and the 1906 Crossley car, which was shown for the first time. The foreign cars were among the best Continental makes, consisting of Panhards, De Dions, De Dietrichs, Peugeots, Delaunay-Bellevilles, Mercedes, &c. There were 9 Peugeots, 4 Panhards, 3 Delaunays, 3 De Dions, and 2 Mercedes shown. The United States was represented by two Winton machines, and other foreign makes included the Minerva, Gladiator, Regent and Corré. British makes shown in addition to those mentioned were Humber, Siddeley, Brotherhood, Enfield, Daimler, Sunbeam, Singer, Iris, Star, &c. Altogether the most representative show yet held in Edinburgh.

I arrived in Edinburgh early on Saturday morning, determined to be about when the doors opened at 10 o'clock, and have a good look round before the usual Saturday crowd arrived. Well, when I presented myself and my humble shilling at that hour the policeman on duty wasn't having any, and added that he was probably the only man in the Force at that moment unwilling to accept money. The reason given for this truly unprecedented proceeding was two-fold. In the first place the police are not money-takers, and in the second place the show wasn't ready. It appears that potatoes, cabbages, and other edibles have first claim on the market area, and twice or three times during the duration of the show the exhibits have, after closing at night, to be crowded into one end till the market gardeners dispose of the fruits of their industry next morning. After they clear out the motor car stands have to be again fixed up, and the cars themselves returned to position. The incorruptible one thought about 11 o'clock would see everything fixed up, but when I returned about 11.30 his successor thought that another hour would see the show in readiness. What a truly surprising gift of prophecy that man had! By half-past twelve the arrangements were so far advanced as to permit of the admission of the public. But it was pretty rough on the man who got out of bed in the middle of the night to get to Edinburgh by 10 o'clock, and the only advantage resulting from the incident, so far as I can judge, is a proper appreciation of a curious feature of the show placard—the absence of any hour of opening. However, I got in quite soon enough for all there was to see. This statement may seem in strange contrast to the earlier comment above, but it simply means that as most of the cars had been on view elsewhere before there was very little really new. The new Singer car, having a 4-cylinder vertical motor, was exhibited for the first time at any show, and created a very favourable impression. The same firm had on view a new 6-cylinder motor, but nothing was known with respect to their intentions regarding it. A very interesting 6-cylinder engine



The Show of the Association of Licensed Automobile Manufacturers at Madison Square Gardens in New York. This is the show which has been run simultaneously in New York with that of the A.C. of America at the 69th Regiment Armoury, and was organised by the Association of Manufacturers, who are the owners of and upholders of the Selden "master patents." In strong contrast to the rival show at the 69th Armoury, the Association's scheme of decoration, although uniform, was of an elaborate and artistic character, as can be judged by the above photograph; a much more simple scheme was adopted by the A.C. of America.

was shown on the stand of Mr. A. C. Penman, of Dumfries. This machine has been made in the estate workshop of Mr. E. J. Brook, Hoddom Castle, near Ecclefechan. The engine has six cylinders of 2½-in. bore and 3-in. stroke cast separately, the castings, very fine work, being by Willans and Robinson, Rugby. Several special features distinguish this engine, including the speed-control by means of the carburettor, but as they are not yet covered by patents they cannot be described just yet. I hope, however to be in a position to give details shortly. The motor is the work of the engineer employed on the estate, Mr. Ross, and is intended for a small run-about car, on which it will give much pleasanter running than a 2-cylinder engine of 10-h.p. at which it is rated. The new Arrol-Johnston Co. adopted an unusual method of at once giving prominence to the Tourist Trophy winner, and economising space. One of their exhibits being an industrial vehicle chassis with skeleton lurry frame, planks were placed on it from end to end, and the car run up till it rested prominently on the platform thus provided.

A languid sort of interest was manifested in the running of the various cars coming by road from London—the De Dion, the Crossley, and the motor 'bus—but it was confined pretty much to the trade and those connected with it.

I heard some complaint of the want of facilities for trial runs, inquirers about cars, who were taken out for the purpose, being required to pay again on returning to the Show; and I know from experience that, on going out for lunch, I had to pay to get in again, no provision being made by means of pass-out checks for re-admission. This appears to be a mistaken policy, and not likely to help those who are helping to the success of the Show—viz., the exhibitors. After all, they take space for the purpose of selling cars; if they are hampered by such irritating restrictions, it may easily be conceivable that they will seek elsewhere for an outlet for their business energies.

The display of vehicles other than pleasure cars was extremely limited. Besides a new Arrol-Johnston commercial vehicle chassis, suitable for omnibus body or for lurry body carrying loads up to four tons, two heavy steam lurries were exhibited—one by D. Stewart and Co. (1902), Limited, Glasgow; the other by the Glasgow Motor Lurry Company, Limited. Somehow these machines have not caught on in Scotland, and although the lighter petrol lurry is making good progress, the heavy steam machine is at a standstill. I had expected to see a good show of tricars, and, being personally interested in the subject, was somewhat disappointed. There were only five on view—one of them, the only one I should have fancied, a twin-cylinder Singer, being priced at over £150. The others were a Rexette, another Singer of less power, and two others of less consequence. There was a good show of Rex and N.S.U. motor bicycles, and some others scattered singly about the stands.

A. F. S.

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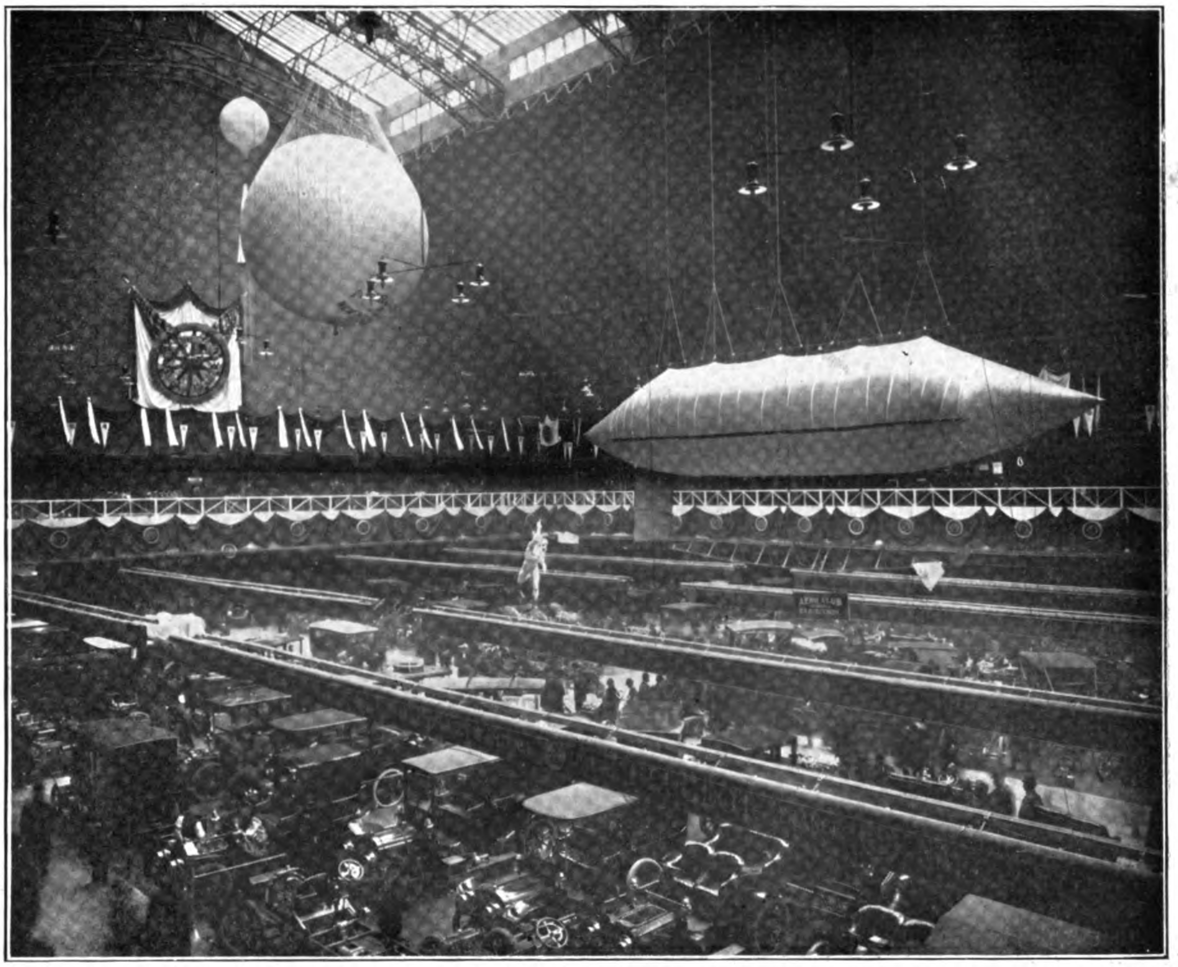
THE MADISON SQUARE SHOW.

THE Sixth Annual Automobile Exhibition, held under the auspices of the Association of Licensed Automobile Manufacturers, opened on Saturday, January 13th. Never has an automobile show been more imposingly staged than was this large collection of cars beneath the roof of the famous Madison Square Gardens. At the entrance was an artistic statue representing the apotheosis of speed; inside, the cars themselves were ranged in orderly array about two wide gangways stretching straight down the length of the building. Individual originality in stands there was none, the staging was a prearranged effect. Down the middle of the main hall ran a line of Roman columns supporting a simple, but well proportioned, cornice, on which the names of the exhibitors beneath were set forth in plain but attractive lettering. Along the top of this cornice was a row of electric lights—powerful but subdued. Similarly arranged at either side were two other lines of columns, and in fact the whole building was decorated on the same modernised Roman lines. Altogether the effect was pleasing to the eye, but it is, of course, quite different to anything we are used to in this country.



The Automobile Exhibition of the A.C. of America in New York at 69th Regiment Armoury. Aeronautical exhibits formed an interesting section of the Show, and a feature, as seen in our photograph, was made of balloons and an airship in the body of the hall. The centre of the hall is marked by the figure of Mercury and the system of plain uniformity in the names of the exhibiting firms, combined with the method of lighting up the signs at night, is a departure in show regulations which, whilst no doubt detracting from the general effect of the Exhibition by the absence of the elaborate stand signs usually displayed, has obvious advantages in its favour.

Of the exhibits themselves there is not much to be said that is of interest to English motorists. Manufacturers in the States are for the most part confining their attention to the perfection of European types, but in the front rank of their respective classes are still those models such as the Winton, Cadillac, and Olds. which have been typical American cars, and have done such credit to their makers in England through the good reputation they established and maintained here. Details of construction vary as much as ever, but the percentage of freak cars steadily diminishes. Ball-bearings for the crank-shaft are in a similar relative minority to their position in this country. Almost the only example is that of the Stevens-Duryea firm, who employ ball-bearings for their 6-cylinder crank-shaft. Lubrication, too, is exercising very general attention, and is obviously being influenced by European practice. Several firms are now discovering the advantages of a simple pump in connection with the ordinary sight-feed fitting on the dash, while others—but they are fewer—are already investigating the possibilities in forced lubrication. Among the novelties, one of the most interesting is the pneumatic installation on the Northern car for working the clutch and the brakes. Driven by the engine is a small compressor capable of supplying air at 75 lbs per sq. inch. For operating the clutch the air is pumped through the hollow crank-shaft so that it acts on a leather-faced diaphragm, which it forces into contact with a corresponding disc on the driven shaft. This same firm have ingeniously converted the gear-wheels driving the cam-shaft into a circulating pump by enclosing them in a water-tight case; while another striking departure on the same vehicle is a ratchet-lever starting-gear instead of the familiar crank-handle.

Not unnaturally, perhaps, the ignition system has undergone a most marked change during the past year. Previously the magneto in any form was hardly in evidence, now it seems to have come to stay, although just at the present time there is no decided preference for either the low or the high-tension systems. Although hardly ever used in this country, it is well known that many American cars fit dry batteries instead of accumulators, and their merits, when used in connection with the magneto, are undoubtedly deserving of general attention. Unlike the accumulator, they are not so liable to deteriorate when idle, and, consequently, when only required for starting the engine, and as an occasional substitute for the magneto, their long life should render them, on the whole, economical.

THE A.C. OF AMERICA AUTOMOBILE SHOW.

In opposition to the Madison Square Exhibition, the A.C. of America held a Show in the Armoury of the 69th Regiment, which was patronised by a large collection of exhibitors, who were not enrolled under the banner of the Association controlling the Selden Patents. Among well known cars exhibited at the Show were the C.G.V., Daimler, Duryea, Ford, Mercedes, Mors, Napier, and White, but naturally the details of these did not differ from those already shown in this country. Among the other exhibits there was little of special interest, although the same tendencies in design as were evident at the other Show were, of course, to be noticed at this Exhibition also.

RACES, RECORDS, AND TRIALS.

Ormond-Daytona Race Meeting.

THIS year's racing on Daytona Beach has brought down several world's records to what would appear to be nearing finality in speed. The extraordinary performances of the Stanley steam car, which we mentioned last week, have been further added to, whilst a splendid victory has been achieved by the British-built 6-cylinder Napier in the 100 miles race. The nature of the beach course suggests the possibility of phenomenal speeds, but the very thought of a mile in 28⅕ secs. (equal to 127·65 miles per hour) makes one's breath come a good deal quicker. Clifford Earp's performance of 100 miles in 75m. 40⅗s., is, of course, a much more wonderful feat, owing to the continued strain entailed by driving at such a nerve-racking speed. The famous Darracq cars have also done well, although they have been driven under such serious handicap, owing to Hemery, the Darracq official driver, having fallen foul of the authorities and being disqualified. It appears that a false start was made in a 5 mile race in which Hemery was running against Stanley. Hemery, however, had got away, not knowing this, and covered the course, it is stated, in 2m. 34⅕s., and when told it was "off," he flatly refused to recognise any such decision and was in the end disqualified from further driving at the meeting. Arrangements were, therefore, made subsequently whereby Guy Vaughan and Chevrolet took over the wheels of the Darracq cars for the rest of the races.

Bad weather during the week necessitated a postponement of some of the races, so that the meeting extended into this week.

Stanley is reported to have undertaken to deliver by June next, to Mr. W. Gould Brokaw, the American millionaire, a steam car capable of covering 1 mile in 25 secs.!

The following are the chief results of the meeting:—

In the one mile race for the Dewar Cup, the Stanley steam car was the winner, in 33s., against Cedrino in a Fiat, in 38s.

Lancia, on a Fiat, secured the mile race for heavy petrol cars with 37s.

Stanley subsequently lowered his own record for the mile to 31⅗s.

Five Miles Open Race.—1. Lancia (Fiat), 3m. 1⅕s.; 2. Fletcher (Fiat), 3m. 2s.; 3. Stanley, 3m. 3s. In the heats Stanley made 2m. 47⅕s.

Five Miles—Heavy Petrol Cars.—1. Clifford Earp (Napier), 2m. 56s.; 2. Downey (Mercedes), 3m. 29⅕s.

Five Miles—Middle-weight Cars.—1. Cedrino (Fiat), 3m. 53⅗s.; 2. Holmes (Wayne), 5m. 46s.

Corinthian Race (Ten Miles).—1. Vaughan (80-h.p. Darracq), 9m. 28s.; 2. Breeze (60-h.p. Mercedes), 9m. 47⅗s. Darracq time during heats, 6m. 36⅗s.

Ten Miles—Middle-weight Cars.—1. Vaughan (80-h.p. Darracq), 7m. 2s.; 2. Cedrino (Fiat), 7m. 50s.

Flying Kilometre.—1. Marriott (Stanley steamer), 18⅖s.; 2. Chevrolet (Darracq) 19⅗s.; 3. Earp (Napier), 21⅗s.; 4. Cedrino (Fiat), 22⅕s.; 5. Kulick (Ford car), 24⅘s.

Flying mile (steam vehicles).—1. Stanley, 28⅕s. = 127·65 miles (205·43 kil.) per hour.

Flying mile (petrol cars).—1. Lancia (Fiat), 37s.; 2. Fletcher (Fiat), 37⅗s.; 3. Cedrino (Fiat), 38s.; 4. Earp (Napier), 40s.

Flying mile (heavy cars).—1. Chevrolet (Darracq), 30⅗s.; 2. Cedrino (Fiat), 36⅗s.; 3. Earp (Napier), 37⅘s.

10 miles Cornellian handicap (for amateur drivers).—1. H. N. Harding (45-h.p. Daimler), 8m. 48⅗s. (handicap 3½m.); 2. Stevens (80-h.p. Darracq), 6m. 42⅘s. (scratch).

100 miles (standing start) International Championship (Minneapolis Cup)—1. Earp (Napier), 75m. 40⅗s.; 2. Cedrino (Fiat), 76m. 39s.; 3. Hilliard (Napier), 81m. 5s. During this race, after the 35th mile, Earp shed a tyre, but took practically little notice of the mishap, simply pounding away in marvellous style and finishing winner in the magnificent record time as above—Cedrino, who stopped to repair a tyre, also drove grandly, securing second place.

Fifteen Miles.—1. Lancia (Fiat), 10m.; 2. Hilliard (Napier), 11m. 36⅗s.

Ten Miles.—1. Lancia (Fiat), 6m. 19⅖s.; 2. Marriott (Stanley), 7m. 35⅗s.

Thirty Miles, open to American cars only.—1. Marriott (Stanley), 34m. 18⅖s.; 2. Chevrolet (Christie), 37m. 24⅗s. In this race the Stanley car was delayed 5m. 40s. at the start, but even then managed to make the best time, as above.

"Two Miles to the Minute Race."—1. Demogeot (Darracq), 1m. 1⅗s.; 2. Marriott (Stanley), 1m. 3s.

In a later race these two cars are reported to have made the following extraordinary times for the two miles:—1. Demogeot (Hemery's mechanician), 58⅘s.; 2. Marriott, 59⅗s.

An objection was lodged, at the end of last week, by Lancia against the Darracq cars, as they were not fitted with reversing gear. This objection appears to have

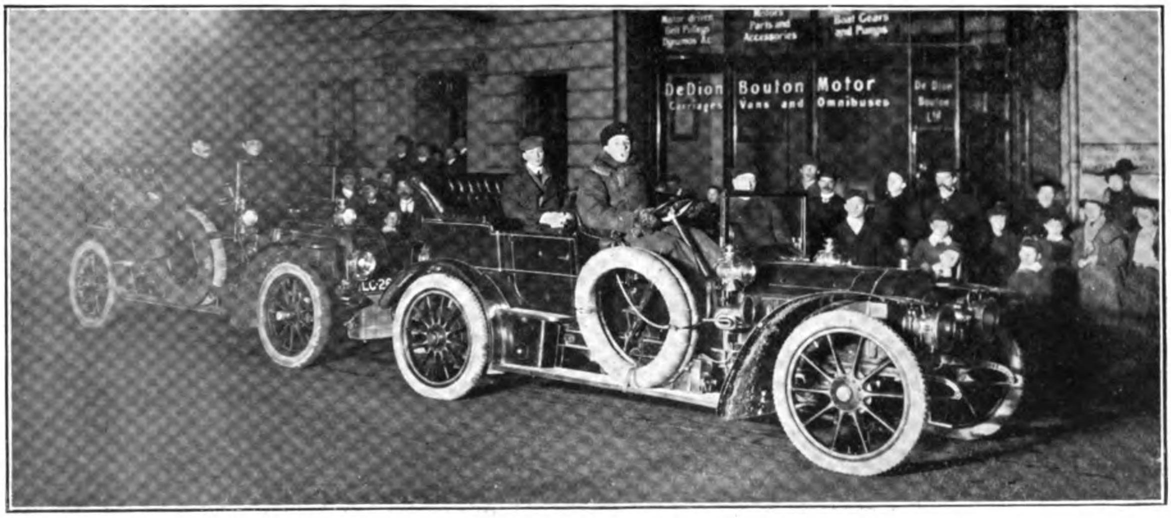


Photo by Argent Archer.

LONDON TO EDINBURGH IN ONE STAGE.—A flashlight photo of Mr. Charles Jarrott on his Crossley Car, and Mr. J. W. Stocks on his De Dion prior to the start for their "non-stop-engine" journey, on Friday night last week, from the London General Post Office to the Edinburgh Motor Exhibition.

been upheld, with the consequence that, on Monday, they were not permitted to run officially in any event over one mile in length. The conclusion of the meeting was finished in splendid weather on Monday of this week.

Tourist Trophy Race.

IT has been officially settled that the race for the Tourist Trophy this year will take take place on Thursday, 27th September, in the Isle of Man.

100-Guinea Cup for Tourist Trophy Race, 1906.

THE Continental Tyre Company announce their intention to again present a 100-guinea trophy (or cash if desired) in connection with this year's race, in the event of the winning car being fitted with their tyres. In the last year's race, it will be remembered, this trophy was secured by the winning Arrol-Johnston car, which so successfully employed these tyres.

Tyre, Lamp and Speedometer Trials—Change of Date.

THE A.C.G.B.I., acting on a suggestion made at a conference with the representatives of the tyre manufacturers on January 25th, has decided that the Tyre Trials —and with them the Lamp, Speedometer and Car Trials —shall begin on Monday, February 26th, 1906, and that entries shall be accepted up to noon on Monday, February 12th, 1906. Sufficient support has already been promised to make the holding of these Trials a certainty, and though one or two of the big firms have not as yet signified their intention to enter, it is thought that they will practically all do so. The regulations, which have already been published in THE AUTOMOTOR JOURNAL, provide for practically all classes of tyres.

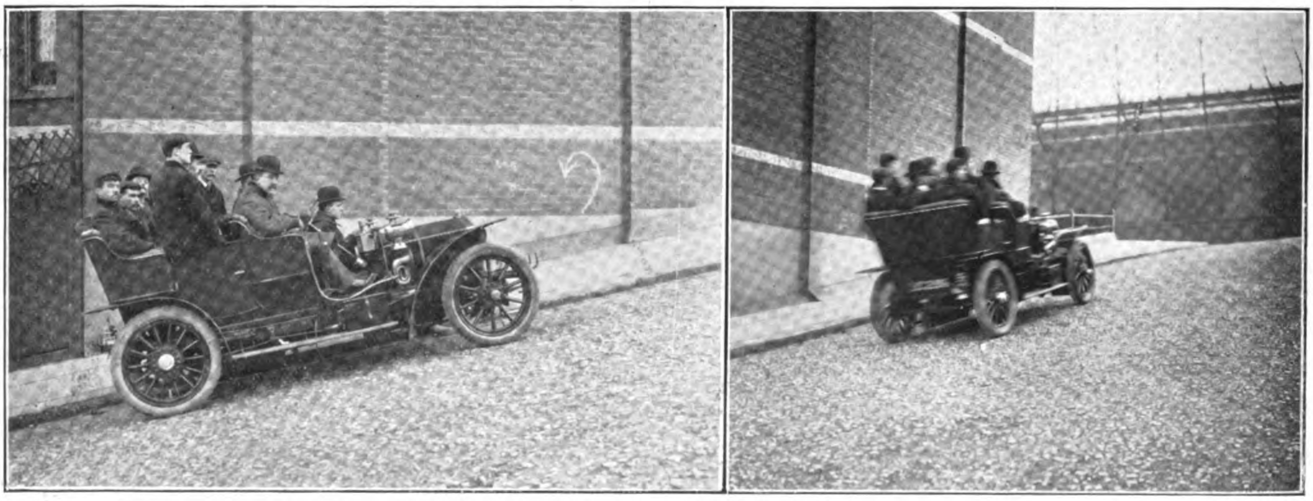
London to Edinburgh.

A STRAIGHT-THROUGH run between these two cities is not the pleasantest, nor the easiest, experience to have of motoring, especially in the winter. During last week, however, no less than three motor vehicles accomplished this self-imposed task. Of these, one was Mr. Chas. Jarrott's 22-h.p. Crossley, another was Mr. J. W. Stocks' 24-h.p. De Dion, and the third was a Fiat 'bus with a "party" of thirteen on board, under the guidance of Mr. Victor Miller. Leaving the G.P.O. at 9 o'clock on Friday night, the 26th inst., Messrs. Jarrott and Stocks, driving their respective cars, set out on their 400 miles' journey. Mr. Stocks acted as pilot, but even in spite of his very thorough knowledge of the route, he once lost his way after leaving Selby. This caused some little delay, but it was nothing of consequence, and the cars kept steadily together all the way to Berwick. Here Mr. Jarrott encountered the customary dog, and only saved an accident by jamming on the brakes with such violence that he deranged the gear, and had to remain behind for a while to put things right again. On this account the Crossley car did not arrive in Edinburgh until 5.30 p.m. Saturday, which was half an hour after the schedule time based on an allowance of 20 hours for the journey. Mr. Stocks arrived within the limit, both having accomplished their object of "engine non-stop" runs. The Fiat 'bus, which had started earlier in the day on Friday, was also in evidence about the same time, having travelled up in 32 hours.

Additional lustre was added to the run by Mr. Jarrott's subsequent adventurous drive up Arthur's Seat with the Crossley car, carrying Mr. Letts, a couple of journalists, a photographer, and a mechanician. With this considerable load Mr. Jarrott surmounted the sharp turns and difficulties of the ascent in fine style, and may, we believe, claim to have been the first pioneer who has ever ascended the celebrated eminence with a fully laden automobile.

5,000 Miles Humber Trial.

ON Saturday last, the 27th inst., Mr. R. M. Wright, of Lincoln, concluded a run of over 5,000 miles on a 10–12-h.p. 4-cylinder Humber car. It was a sporting trial, organised and carried out entirely by Mr. Wright, who was anxious to show the people of Lincolnshire what could be done with a British-built car of moderate power, for which, among others, he has an agency in that county. Local residents were enrolled as observers, among them being such well-known motorists as Messrs. W. B.



PREPARING FOR THE TOURIST TROPHY RACE.—A rule which has been instituted by the A.C.G.B.I. in connection with the T. T. race this year, provides that each car with its full load must be able to ascend a grade of 1 in 6 on its lowest gear and must be capable of travelling half a mile on the flat on the top gear without clutch manipulation at a speed of not more than 12 miles per hour. Recently the Rolls-Royce Tourist Trophy car of last year has undergone a series of tests under these conditions, when both these requirements of the rule were more than complied with. Our photographs show the car "at rest" upon, and actually ascending a gradient of 1 in 6·09, not only with the specified minimum weight (equal to four passengers) but with nine passengers averaging 11st. 2lbs. each.

Jevons (the first motorist in Lincoln), A. A. Padley, W. S. Foster, W. Foggo, M.I.M.E., J. R. Hatfield, W. Rasdall, and J. T. Coleman (Chief Constable of Lincoln).

The following is a summary of the running costs as published by the organiser of the trial:—

					£	s.	d.
Petrol	... ...	262 gals.	at 1s.	=	13	1	9
Oil ...	... ...	18 gals.	at 5s.	=	4	10	0
Grease	... ...	28 lbs.	at 6d.	=	0	14	0
Gear Oil	... ...	1 gal.	at 3s. 6d.	=	0	3	6
Accumulators	...	11 recharges	at 9d.	=	0	8	3
Commutator	...	Ring replaced		=	0	3	6
		Total for 5,000 miles		...	19	1	0

Running cost per mile = 0·915*d*.

In addition to this it is estimated that a sum of about ¾*d*. per mile should be allowed for tyre depreciation, which would permit retreading each cover at a cost of £3 12*s*. each.

The total involuntary stops for the car amounted to 49 mins., and for the tyres 2 hrs. 13 mins. for five punctures. The trial occupied over 41 successive days, the observers choosing the routes. Rain fell heavily on 11 days, and the roads were only dry on 5 days.

At the conclusion of the run on Saturday, the Humber Company and the Dunlop Tyre Company—the respective manufacturers of the car and tyres—jointly gave a luncheon to Mr. Wright at the Crystal Palace. Mr. E. Powell, chairman of the Humber Company, occupied the chair, and among those present were Messrs. W. B. Jevons, A. A. Padley, T. C. Pullinger, W. Phillips, W. J. Greer, J. Mason, L. Coatalen, and L. M. Bergin. While this pleasant function was in progress, the car was dismantled so that the parts were afterwards available for inspection. So far as could be seen, everything was in excellent condition. There were signs of there having been, at some time or other, a lack of oil on one of the big ends, and of the second speed having been injudiciously engaged occasionally, but otherwise no signs of undue wear could be seen on any of the parts.

The Grand Prix.

Santos Dumont will possibly be a starter in this race, with a car fitted with a Levasseur motor, with between 16 and 24 cylinders, developing anything up to 300 h.p. The date mentioned for the race is June 25th and 27th.

Gradual Variable Speed-Gear Contest.

A competition is to be organised in France by *Les Sports*, acting in conjunction with M. Ernest Archdeacon, for variable speed-gears.

Calcutta-Ranchi Motor Trials.

The Automobile Association of Bengal announce that, owing to the paucity of entries received, they were compelled to indefinitely postpone the holding of the proposed Trials on the 26th January and following days.

Western India Trials.

We learn that two Argyll cars have been successful in the four days' reliability trial organised by the Motor Union of Western India. The trial was over a distance of 500 miles. In class B (cars £250 to £450), the 10-12-h.p. car has secured two Cups, and in class C the 16-20-h.p. car wins the Challenge Shield and a Challenge Cup. These were the only Argyll cars entered.

Circuit Européen.

By degrees the detailed arrangements are shaping themselves for this important motoring event for 1906. The general outline for the route and the dates have been agreed upon, allowing for 15 days running and 6 exhibitions at the principal centres traversed. The suggested route is as follows:—

July 29—Paris-Limoges.
,, 30—Limoges-Toulouse.
,, 31—Exhibition at Toulouse.
Aug. 1—Toulouse-Le Puy.
,, 2—Le Puy-Aix-les-Bains.
,, 3—Exhibition at Aix-les-Bains.
,, 4—Aix-les-Bains-Milan.
,, 5—Exhibition at Milan.
,, 6—Milan-Trieste.
,, 7—Trieste-Klagenfurth.
Aug. 8—Klagenfurth-Vienna.
,, 9—Exhibition at Vienna.
,, 10—Vienna-Prague.
,, 11—Prague-Breslau.
,, 12—Breslau-Berlin.
,, 13—Exhibition at Berlin.
,, 14—Berlin-Hanover.
,, 15—Hanover-Cologne.
,, 16—Exhibition at Cologne.
,, 17—Cologne-Mézières.
,, 18—Mézières-Paris.

Cars are to be penalised by one point per minute during breakdowns, except for tyre troubles. These points will be added to the time points allowed under the rules to each class for the total time occupied throughout the run. Time occupied in tyre troubles will count against a competitor, in the event of such time not being made up again in each day's run under the maximum time allowance—which provides for one point per minute penalisation for any excess of time beyond the maximum allowed to each class.

It is proposed to limit the total number of entries to 130—so that late entrants may find themselves "out of the running." Each of the recognised clubs will receive entries for their country—entries until April 15 will be at single fees, after that date at double fees. The club of each country will be responsible for looking after the roads selected for the contest, in regard to flagging and maintaining order and providing protection against possible accidents at congested points, &c. The official documents will be in French. Diplomas will be given to every competitor completing the full itinerary, in the joint names of the Automobile Clubs of France, Germany, Austria and Belgium. Already a number of the leading Continental makers have signified their intention to enter cars, and altogether there is little doubt the event will prove to be, from a commercial point of view, one of the most important contests hitherto organised.

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MOTOR CYCLING.

International Cup for Motor Cycles.

It looks as if the motor cycle "Little Gordon-Bennett" contest of the Moto Club de France is to be squeezed out of existence, now the Cup has been won by Austria and taken out of France, in similar fashion to the attempt on the Gordon-Bennett Race for cars. It is with difficulty that a French maker has been found to enter for this year's contest. Neither Alcyon, Peugeot, or Griffon machines are to be run, and the only house to enter is the Gillet, the makers of which are to have three machines in line.

A New Motor Cycle Cup.

Following the meeting when this decision was arrived at, a cut and dried announcement of a new "Championnat International de Motocyclettes" was sprung upon the motoring world by the Moto Club de France. This is to take place in May, and there will be three categories, viz.:—(1) for motor bicycles under 30 kilogs. weight; (2) under 50 kilogs.; and (3) 2-seated motor cycles, with three or four wheels, under 250 kilogs. If, however, this new contest is so arranged that it promotes the use of *bona fide* touring machines, there need not be much outcry at the absence of the "crack" French motor cycles from the International Cup, as the new race should tend to help along the touring machine industry considerably.

AERONAUTICS.

"And Thick and Fast They Came at Last."

We mentioned last week the experiments of a Danish aeronaut with a motor-driven aeroplane, and now it would appear that quite a number of people (who hope to attract attention or win the Deutsch Prize with machines of the aeroplane type) are appearing upon the scene. Chief amongst these apparently is the Polish aeronaut, Mr. Godek, who has arrived in Paris, we are informed, in order to make trial trips with his aeroplane *before* competing for the Deutsch-Archdeacon Prize. Why Mr. Godek should regard Paris as a good place to experiment in or near is something of a mystery. As an example of the sort of statements finding currency on the subject it is claimed for his machine that the aeronaut operating it can take any position, "unlike the Wright aeroplane, which requires the operator to lie down." Surely it should be obvious that the question of lying down or standing up is merely a matter of wind-resistance and the reserve force available in the aeroplane, together perhaps with the comfort of the operator. Possibly, too, the feeling of security may have something to do with it. Anyone who has looked over the edge of a lofty cliff knows how very much safer he feels if he lies down to do so.

A "Léger" Machine.

Another competitor is announced in the person of M. Léger, engineer to the Prince of Monaco, who is understood to be adopting a machine of the "helicoptere" type. The Léger machine is said to have two vertically-lifting propellers, one above the other, revolving in different directions, and a tractive propeller in front. A mysterious particular announced in regard to the propulsion of the machine is that it is stated to be driven by two dynamos exercising a power of 10-h.p. This is not a very likely departure at the present day.

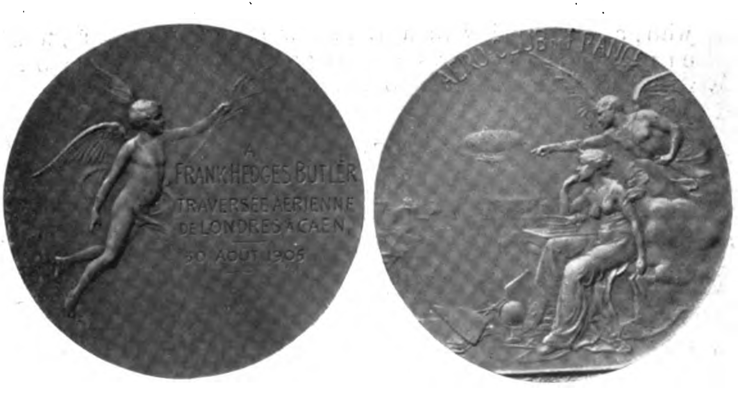
Other French Experimenters.

Two inventors of the name of Martzoff and Vuina are carrying on a number of experiments with what is said to be a new type of aeroplane in the neighbourhood of Mostesson. The aeroplane is mounted upon the framework of a quadricycle, and pulled forward by a tractive propeller. The tractive effort of the propeller driven by a 25-h.p. motor is effective in propelling the whole system along the road. The inventors hope, ultimately, to be able to attain sufficient speed to enable the aeroplane to rise in the air. Hitherto the speed attained has not been as great as was anticipated, but as the speed of rotation has been relatively small, it is expected that this condition of affairs will be improved at an early date.

Retirement of Count Zeppelin.

The rumour that, as a result of the failure of his great effort, Count Zeppelin has determined to definitely retire from aeronautics is now confirmed. Most people will feel a pang of regret at this final confession of failure on the part of the venerable and enthusiastic experimenter.

Though, owing mainly to the unsuitable dimensions of his apparatus and the inappropriate shape of his gas-vessel, great exploits were hardly to be expected from even the last Zeppelin airship, the circumstances which largely destroyed it were after all, it must be remembered, in the main accidental. It is generally understood that the catastrophe was due to the derangement of longitudinal stability in such a manner as to cause one end of the airship to come into violent contact with a tree. Had the result not been so disabling to the airship, no doubt longitudinal stability would soon have been attainable, though that any effective speed would ever have been obtained with the Zeppelin airship is almost more than doubtful. When all is said, however, it must be recollected that Count Zeppelin is an enthusiast of the best type. He has sacrificed his own fortune in his experiments, he was the second in the history of aeronautics to really direct and manœuvre a navigable balloon, and his experiments with aerial propellers, both on balloons and boats, has had a decided effect in advancing knowledge in regard to the actual propulsive effort that could be attained by this means. It is probably only Count Zeppelin's advanced age that decides him on retiring from his field of investigation, for after all the two accidents which he has had were no more damaging than each of those which overwhelmed the Lebaudy airship in the moments of its greatest triumphs. If the engineers and capitalists engaged in that great "emprise" had retired after two misfortunes, they would never have attained success. But, after all, one must retire some time, and Count Zeppelin has unquestionably done good work in the department of research to which he devoted his fortune, and a long period of his life.



Mr. Frank H. Butler is one of the best known supporters of aeronautical projects, and personally takes a great practical interest in the development of everything pertaining to aeronautics. We some months ago published a photograph of his "pilot" certificate, issued by the Aero Club of France, and he has now been further honoured by the same body, by the grant of a medal to commemorate the longest cross-Channel trip. This is the first one ever granted by them to an Englishman, and was awarded to Mr. Butler and Mr. Percival Spencer. We produce this beautiful medal above, on one side of which is engraved the record of Mr. Butler's performance, in the following words:—"A Frank Hedges Butler Traversée Aérienne de Londres à Caen. 30 Aout 1905."

The late Mr. Stanley Spencer.

The death of Mr. Stanley Spencer is announced from Malta. He was returning home from Calcutta when he fell a victim to an attack of typhoid fever, which became so serious that he was disembarked at Malta, at which place he subsequently succumbed to the fever. Mr. Spencer, as most people know, was a partner of his two brothers in the well-known Highbury firm of balloon-makers. He has always taken a great interest in aeronautical matters, and in 1903 constructed the "Mellin" airship, with which he passed over London. Mr. Spencer has made balloon ascents and parachute descents with much intrepidity in nearly all the principal countries of the world, so that to die of a commonplace disorder like typhoid fever is a rather unexpected termination to so adventurous a life, and one in which he had so often executed daring and dangerous exploits.

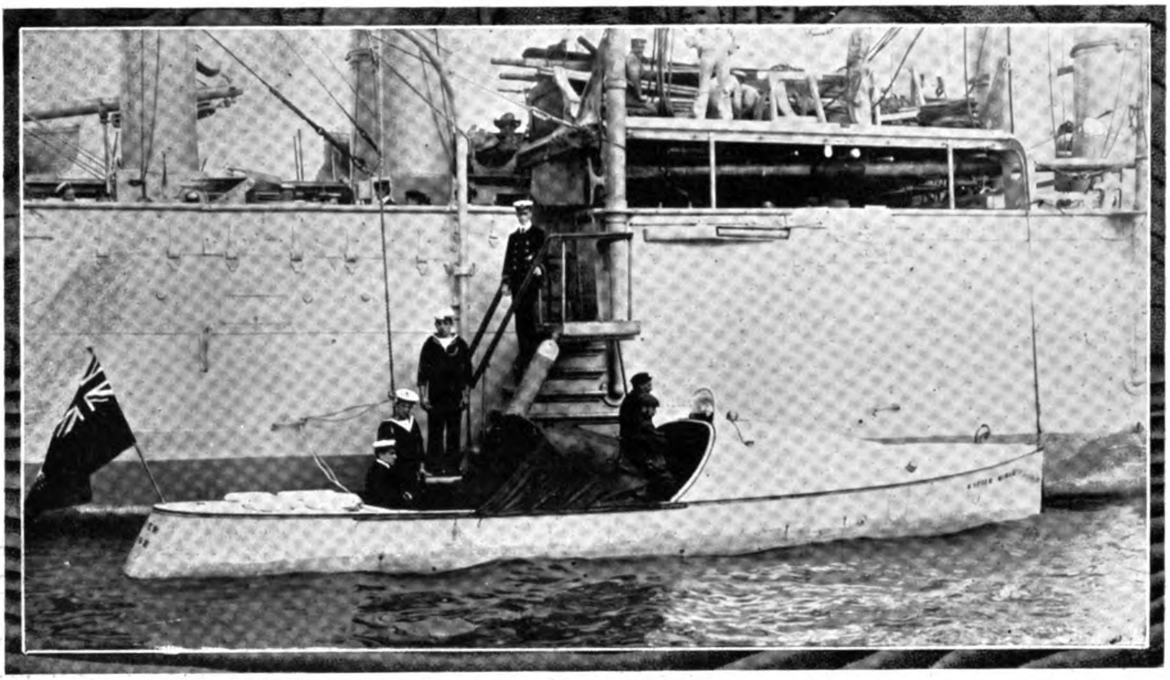
Not in Keeping with the Times.

It is somewhat disconcerting to find the Engineering Supplement of *The Times* reproducing the letter of Mr. Roe which we published last week, with the following editorial comment—the italics are ours. Says *The Times Supplement*:—

> "Whilst giving that encouragement to new enterprise denoted by the admission of what is patently a free advertisement to our literary columns, it is not to be supposed that we in any way adopt the writer's estimate of his undertaking, *being of the opinion, indeed, that all attempts at artificial aviation on the basis he* describes are not only *dangerous to human life, but foredoomed to failure from an engineering standpoint.*"

Prophecy has been generally admitted to be one of the most gratuitous errors which one can commit. It is bad enough to prophesy as regards the far distant future, and in regard to subjects so deeply wrapped in the mysteries of the "far-off," that no one living will have a chance of ascertaining whether the prophecy is destined to be fulfilled or not. It is more than usually gratuitous to prophesy or maintain the impossibility of what has already been done. Unhappily, this is just the view of the man in the street. It is not calculated to promote research, or what is of, perhaps, more importance, provision of funds for the purpose of research. That *The Times Engineering Supplement* should take this old-fashioned view, contraverted as it is by innumerable facts, is distinctly disheartening.

* * * *



During the 1904 season, the Admiralty were already coquetting with the motor boat in connection with the naval manœuvres. Our picture is an interesting little souvenir of this fact and represents Napier Minor, which was placed by Mr. S. F. Edge at the disposal of the Admiralty, alongside the second-class cruiser, Apollo. The photograph is by Mr. A. F. Evans, who was enabled to get this snap from a steam cutter placed at his disposal by the captain of the Apollo.

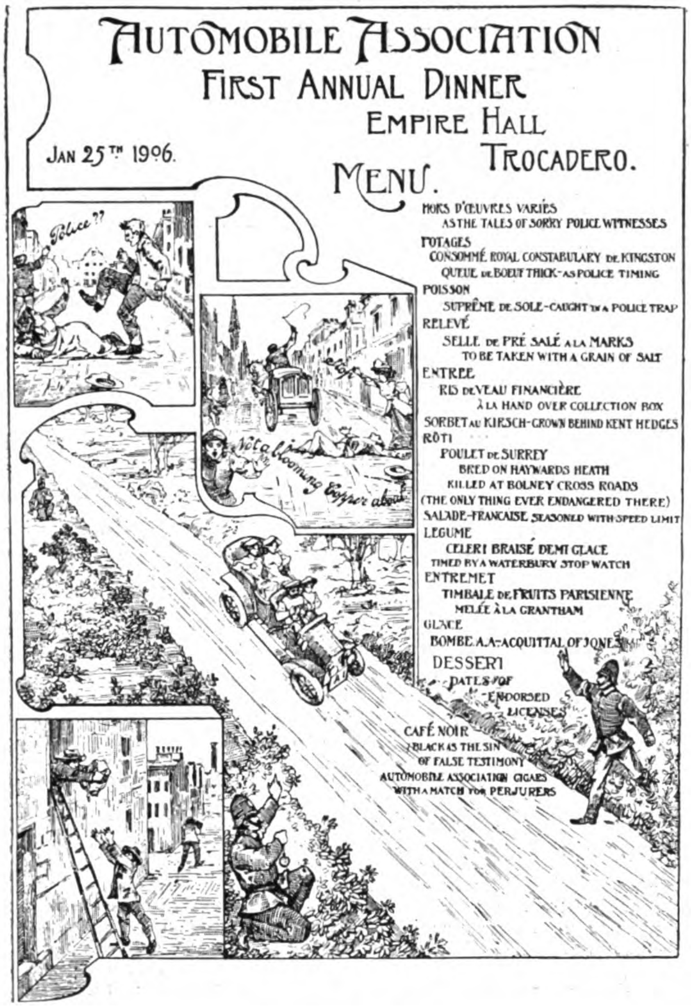
Major Lindsay Lloyd, R.E.

Owing to ill-health, we regret to learn that Major Lloyd has been reluctantly compelled to relinquish the post of President of the Marine Motor Association.

Where the Fire Engine Failed.

Messrs. Bowley and Sons' works were successful in "setting the Thames on fire" on Saturday morning last, and provided a brilliant pyrotechnical display for those who happened to be about Battersea at the time. Great floods of burning petrol and other oils "brightened" the surface of the Thames, and did a good deal of destruction to barges in the river. The proceedings of the fire floats, however, were calculated to raise a smile. How it could be supposed that burning oil floating on water was to be extinguished by pumping more water on it, is one of those mysteries of the official mind which ordinary people are unable to fathom. One is reminded of the suggestion, sarcastically attributed by *Punch* to a medical paper, that ice having been found frequently contaminated with microbes, it should never be used without having previously been boiled!

CLUBS AND ASSOCIATIONS.


Police??
Stop
Not a blooming Copper about

AUTOMOBILE ASSOCIATION
FIRST ANNUAL DINNER
EMPIRE HALL
TROCADERO.
JAN 25TH 1906.

MENU.

HORS D'ŒUVRES VARIÉS
AS THE TALES OF SORRY POLICE WITNESSES
POTAGES
CONSOMMÉ ROYAL CONSTABULARY DE KINGSTON
QUEUE DE BOEUF THICK-AS POLICE TIMING
POISSON
SUPRÊME DE SOLE-CAUGHT IN A POLICE TRAP
RELEVÉ
SELLE DE PRÉ SALÉ A LA MARKS
TO BE TAKEN WITH A GRAIN OF SALT
ENTREE
RIS DE VEAU FINANCIÈRE
À LA HAND OVER COLLECTION BOX
SORBET AU KIRSCH-GROWN BEHIND KENT HEDGES
RÔTI
POULET DE SURREY
BRED ON HAYWARDS HEATH
KILLED AT BOLNEY CROSS ROADS
(THE ONLY THING EVER ENDANGERED THERE)
SALADE-FRANCAISE SEASONED WITH SPEED LIMIT
LEGUME
CELERI BRAISÉ DEMI GLACE
TIMED BY A WATERBURY STOP WATCH
ENTREMET
TIMBALE DE FRUITS PARISIENNE
MELÉE À LA GRANTHAM
GLACE
BOMBE A.A.-ACQUITTAL OF JONES
DESSERT
DATES OF
ENDORSED
LICENSES
CAFÉ NOIR
BLACK AS THE SIN
OF FALSE TESTIMONY
AUTOMOBILE ASSOCIATION CIGARS
WITH A MATCH FOR PERJURERS

AUTOMOBILE ASSOCIATION ANNUAL DINNER.—The clever menu card which was specially designed for the Association's Dinner last week happily hits off many of the little weaknesses of certain sections of the police in connection with their treatment of motorists.

Automobile Association.

Very enjoyable was the first annual dinner of the Automobile Association at the Trocadero last week. Under the genial chairmanship of Col. W. J. Bosworth the gathering was notable for its short toast list and its unprecedented list of popular entertainers. Altogether there were some 180 diners present, and as an assemblage of victims (or their sympathisers) of police—pardon, motor traps—the evident enjoyment of the guests would have made the Surrey and other police trappists pale with rage. The menu, which we reproduce in facsimile, was a cleverly-conceived skit upon the questionable tactics of certain sections of the police, and graphically drew attention to the neglect of their proper duties.

In a quaintly facetious and highly amusing speech, Mr. Mostyn Pigott proposed the toast of the Association. He said that he was not the owner of a car, and that if anybody bequeathed him one in his will he would be prompted to murmur, "Some enemy hath done this thing," because he would not know where to put the implement in question. To a certain extent he thought the Automobile Association rendered existence almost bearable to the impecunious pedestrian. Said Mr. Pigott, "As a private citizen I need protection. By protection, I mean protection from the dare-devil begoggled fellows who drive motor cars to the infinite peril of myself, my family, my hens and chickens, if I have any, or my neighbours' if I havn't. The law doesn't afford me this protection, nor do the police. Legal compensation for injuries is all very well, but it isn't protection. I prefer the protection, and am content to let the other fellow have both the injuries and the redress. That is where, as a private citizen who has not the privilege of owning a motor car, I look to the Automobile Association for protection, and find it. While the police are hiding behind hedges and lurking in ditches waiting for the fellow I'm afraid of, to break the law, the Automobile Association sends out its yellow badged scouts and prevents him breaking it. That is what I call protection."

Col. Bosworth, in responding, said that motorists had taken their persecution too long lying down, hence the formation of the Association. All members asked for was equal rights with other users of the highway—they asked no more. The Association had no sympathy with the motor hooligan any more than with the hooligan van or carriage driver. He was glad to say the friction between motorists and the police was now gradually subsiding. He had actually seen one of their members driving home the "components of a police trap" in his car after their day's work. He hoped the day was forthcoming when the police-trap constables would say: "Marcellus and Bernardo, break we our watch up."

Sir Archibald Macdonald, who also replied to the toast, spoke in flattering terms of the splendid work done by the chairman. The only reason for van drivers invariably driving on the wrong side of the road was, he thought, that they found it more to their liking going to sleep on the right side.

Lt.-Col. Mark Mayhew proposed "The Visitors," Mr. Sidney Straker replying; and Mr. Charles Jarrott, in giving the toast of "The Press," passed a well-merited compliment upon the particularly energetic and unflagging methods of Mr. Stenson Cooke, the secretary of the Association.

Amongst those who supported the chair were:—Sir A. Macdonald, Bart., Col Mark Mayhew, the Chevalier Distin Maddick, Baron A. Turckheim, Messrs. Sidney Straker, Mostyn Pigott, Charles Jarrott, Chas. Temperley, A. Harris, L. Schlentheim, Wm. Letts, Walter Gibbons, Capt. Leveson-Searth, Messrs. Stanley Spooner, Andrew McKelvie, B. C. Cass, F. Thring Robertson, H. W. Staner, C. L. Freeston, S. Byng Maddick, C. Cordingley, De Courcy Beamish, J. R. Cleave, A. Pelland, J. Barry O'Callaghan, H. Barnett, W. Willett, Turcat-Mèry, H. E. Harrison, J. P. Waddington, F. Glenister, C. P. Bennett, J. Ferguson, E. Baker, J. Duffy, R. O. Bryen, F. Newson-Smith, F. W. Dewdney, F. W. Lord, H. Newson-Smith, W. Worby Beaumont, A. Davies, J. Temperley, L. Brennan, C.B., Rocco Gatti, A. J. Wilson, J. W. Stocks, C. Pinoli, F. F. Wellington, E. H. Lancaster, R. Noble, J. D. Willis, A. Hoboken, J. A. Parkes, W. J. Peall, Dr. Stillwell, Mr. R. D'Arcy Baker, Capt. de Fasge, Dr. Jackson Lang, Messrs. Graham Notley, W. Wyatt, F. M. Trevor, M. E. Schlentheim, J. S. Purdie, E. E. Robb, R. I. Atkinson, L. Martin, J. S. Gibson, H. A. Matear, H. Tanner, Chas. Heathcote, D. W. McInnes, Dr. D'Esterre, Messrs. E. Heathcote, W. R Brooke, L. Langford, Major Woodley, Messrs. J. Finlay, C. H. Steam, A. J. McCarthy, W. Rees Jeffreys, F. T. Woodfine, F. Straight, S. Hyman, E. Aplin, F. Elliott, H. Sutton, Ben Nathan, Arthur Roberts, H. Masters, M. Warner, W. de Freece, H. Milburn, E. Romaine, &c.

The Aero Club.

THE Aero Club has recently purchased a special balloon for the use of its members. This balloon, built on up-to-date principles, is fitted with new type of valve, rip cord, and all the latest improvements, and will accommodate four to five persons, according to the length of the journey. Members can hire this balloon for two guineas a time, and special facilities have been made by the club for its quick inflation, &c.

The following have been elected to the club committee of 1906:—The Right Hon. Lord Howard de Walden, the Right. Hon. Lord Montagu of Beaulieu, the Hon. C. S. Rolls, Maj.-Gen. Sir H. E. Colvile, K.C.M.G., C.B., Rear-Admiral Sir Charles Campbell, K.C.M.G., C.B., Col. J. E. Capper, C.B., R.E. (Director of Military Ballooning), Professor A. K. Huntington, Dr. F. W. H. Hutchinson, Messrs. Roger W. Wallace, K.C. (chairman), C. F. Pollock, Hugh Weguelin, Frank Butler, A. Leslie Bucknall, Martin Dale, Stanley Spooner.

British Empire Motor Trades' Alliance.

THE Daimler Motor Company have sent £20 to the Alliance towards their Foundation Fund, this being the company's second donation to this fund.

British Motor Boat Club.

THE second lecture of the club will be held in the club room at the Craven Hotel, on February 15th, at 8 p.m. The paper will be given by Lieut. Windham, R.N., and will deal chiefly with matters relating to petrol and paraffin engines as fitted to motor boats, the markings on charts, laying out courses on charts, lights at sea, handling motor boats in rough seas. The paper will be followed by about sixty lantern slides on lifeboat work in Ireland, the slides being shown for the first time. There will also be about sixty slides on various motor subjects. The secretary will be pleased to receive, on loan for the evening, any slides interesting to motor boat owners. An informal dinner will precede the lecture.

Motor Union.

THE General Committee of the Motor Union of Great Britain and Ireland at their January meeting, elected the following distinguished vice-presidents of the Union:—The Rt. Hon. the Earl of Onslow, G.C.M.G.; the Rt. Hon. Earl Roberts, K.P., G.C.B., the Rt. Hon. the Earl of Lonsdale, the Rt. Hon. the Earl of Plymouth, Lord Hugh Cecil, Sir Hickman Bacon, Bart., J.P., D.L.; Sir Lindsay Wood, Bart., J.P., D.L.; the Rt. Hon. Sir J. H. A. Macdonald, K.C.B.; Sir Hugh Bell, Bart., J.P.; Sir David Salomons, Bart., J.P., D.L.; Sir A. Acland Hood, Bart., M.P.; Sir W. G. D. Goff, Bart.; Col. Bowles, J.P.

At the same meeting the Earl of Mexborugh, W. Birtwistle, J.P., and 20 other automobilists were elected to life-membership, and a further addition of 200 ordinary members, since the last meeting, was reported. The growth of the Union has been very rapid, and it now numbers considerably over 10,000 members.

The Directors of the Gaulois Tyres, Limited, have made a contribution of 25 guineas to the Legal and Legislative Defence Fund of the Motor Union. The thanks of the Union have been conveyed to this well-known Company for their generous support. Altogether the sum of £1,250 has now been contributed to this important Fund.

Motor Union First Provincial Meeting of 1906.

IT is proposed that the first provincial meeting of the Union this year shall be held at Birmingham. The date provisionally arranged is the 26th of May. The committee will meet at the Grand Hotel in the morning, and an interesting programme is under consideration for the afternoon. In the evening there will be a general reunion at the Grand Hotel, when the fifth Annual Dinner of the Midland Automobile Club, and the fourth Provincial Dinner of the Motor Union will be combined in one event. The Midland Auto mobile Club have all the arrangements in hand.

Motor Union "Season Tickets."

IN addition to the list of Provincial Exhibitions, published in a recent issue of THE AUTOMOTOR JOURNAL, to which free admission may be obtained on production of Motor Union tickets of membership, it was arranged for the same tickets to pass, without charge, into the Exhibition which is being held this week at Edinburgh, in the Waverley Market.

Motor Yacht Club.

FEBRUARY 27TH has been fixed for holding the Annual General Meeting.

Nottinghamshire A.C.

AS usual, the Annual Dinner of this Club, held at the Victoria Station Hotel, last week, was an unqualified success. Mr. Charles Hardy presided over a company of about 100 members and friends.

Mr. H. Belcher, in proposing the toast of "The Parent Club, Motor Union, and Automobilism," referred to the successful establishment in London of the motor omnibus, and pointed the moral by suggesting that the Corporation of Nottingham might pause in their proposition to lay down tramways for Sneinton. He believed they intended to spend something between £100,000 and £120,000 in putting down the system, and in street improvements to make room for the trams. Yet, if it were not for the prejudice against motors generally, they could provide a motor 'bus service through Sneinton, which would not in any way interfere with property, which would turn any corners there were to be negotiated, and which would not require the widening of any streets, for about £12,000. For that sum they could put down 15 motor 'buses, which would give a very good service, and save the town the enormous outlay that was contemplated. He thought the Notts Club might well take the matter up with the Corporation.

Mr. Rees Jeffreys, in responding on behalf of the Motor Union, naturally touched upon the Election question, and said it had done a great deal to educate not only the Legislature, but the electorate in the utility of the motor car, and it was safe to say that the new House of Commons would be far more sympathetic towards the industry than the past had been, while it had been fortunate that so many of the voters had been taken to and from the polling booths in cars, enabling them for the first time to realise the wonderful control that the drivers exercised over them. Whether the country

The Automobile Association's First Annual Dinner at the Trocadero Restaurant on Thursday, January 25th. Chairman, Col. W. J. Bosworth.

adopted Protection or stuck to Free Trade, it certainly would have to have, in a commercial country, an efficient and cheap system of land transport, and that could only be secured by making full and unfettered use of the motor vehicle; and it was their duty, both as clubs and central organisations, to advance the benefits of the motor as much as possible.

Amongst the other speakers were:—Messrs. A. Barlow, Claude Johnson, E. M. C. Instone, Clay, Charles Hardy (the president), and Booth Granger (the hon. secretary).

An excellent musical programme gave little chance for conversation between the speeches.

Yorkshire A.C.

At the annual general meeting on January 26th, held at the Leeds Great Northern Hotel, Earl Fitzwilliam was elected president, and the following members were elected as vice-presidents and to the committee for the ensuing year:—

Vice-Presidents.—A. W. M. Bosville (Bridlington), B. Bagshaw (Leeds), C. B. Crawshaw (Dewsbury), W. Penrose-Green (Leeds), H. R. Kirk (Leeds).

Committee.—E. Watson (Leeds), A. Towler (Ilkley), P. A. Stanier (Leeds), A. W. Dougill (Leeds), E. Faiers (Bradford), H. A. Jones (Bradford), R. Winn (Leeds), E. H. Hepper (Leeds), Dr. Rumboll (Leeds), A. Exley (Leeds), A. W. Roslington (Leeds), A. J. Hare (Roundhay).

Hon. Secretary.—C. P. Wilson (Leeds).

Hon. Treasurer.—L. Hey (Leeds).

Hon. Solicitor.—Alf. Masser (Leeds).

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

SCHOOLS FOR MOTOR MEN.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The increasing number of motor schools, the advertisements of which are a constant feature of several daily newspapers, has led to some enquiry into the *bona fides* of these establishments, and it is not surprising to find from evidence brought forward by "pupils" who paid their fees, and received practically no useful information in return, that some of the "schools" are worthless from the point of view of the student.

We were particularly interested in some remarks made by Mr. Cecil Edge in the *Daily News* a short time ago, as to the time needed to obtain a thorough knowledge of motor car construction, Mr. Edge contending that it is only by actual experience in driving and in dealing with breakdowns as they occur, that the average chauffeur can gain the kind of experience he really needs. Mr. S. F. Edge in the same issue of the same paper, also put great stress upon the necessity of a perfect mechanical training, and intimated that he was prepared to supply competent motor mechanics from the home of the celebrated Napier.

Everyone will admit that such training, whether achieved in big works such as the Napier, or upon the road in actual driving experience, is far more valuable than any amount of training acquired at a motor school, and from a purely mechanical standpoint this is quite correct.

But there is another aspect of this question which seems to have escaped notice. Is it not a fact that the great majority of car mishaps result from tyre punctures, bursts, or other tyre defects? Although admittedly vastly improved during the last few years, we think it is indisputable that the tyres are still the weakest feature in motor car construction at the present day, absorbing quite 75 per cent. of the total cost of car upkeep. This being so, is it not essential that every chauffeur should have as good a tuition in tyre fitting and repairing as in the purely mechanical side of the motor car, more especially so when it is borne in mind that the result of that tuition should be a greatly diminished cost of tyre upkeep?

Engine construction has attained such a high level of efficiency that engine breakdowns are now never very serious. On the other hand, tyres are always prone to puncture, and subject to other troubles. They need periodical attention, no matter how good they may be, and a chauffeur or motor mechanic who has availed himself of our free school of tyre repairing by vulcanization, can apply the proper remedies at the right time, and greatly prolong the life of the tyres in use.

A fully competent chauffeur or mechanic should be able to repair tyres in the garage or upon the road as the circumstances demand, and in order to make every such chauffeur fully competent to do this, we opened, some time ago, a free school of instruction in tyre repairing, at 39, Great Eastern Street, and, as a result, we have been able to recommend chauffeurs and mechanics for positions which they could not have applied for otherwise.

It seems to us, therefore, that the education of the chauffeur or motor mechanic is not complete unless he can execute emergency tyre repairs, and if he cannot do these, it is obviously his own fault, for our free demonstrating school is open to anyone at any time who cares to avail himself of its great advantages.

Yours faithfully,
HARVEY FROST AND CO., LIMITED,
H. Harvey Frost, Managing Director.

January 23rd.

INACCURATE DESCRIPTIONS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We notice, in a description of the Lacoste magneto that appeared in a contemporary of yours, that the high-tension distributor of this machine is described as a jump-spark type, and we should be glad, therefore, if you would kindly publish this letter, so as to remedy any misconception that may have arisen over this point.

The high-tension current, in the Lacoste magneto, is distributed through "rub contact" by means of a small steel arm, fixed to the half-time shaft of magneto, carrying at its extreme end a small nickel knob which rubs on to raised nickel studs set at certain intervals in a solid block of vulcanite, this vulcanite being enclosed in an aluminium casing.

The steel blade is so set that the knob it carries touches the raised nickel studs with very little pressure, and when revolving between the nickel studs, does not touch the insulating material at all, this being to prevent any deposit of metal particles on the insulation, which might short one stud to another.

What we think probably misled the writer of the article in question, is the fact that, if the magneto has run for a very long time without attention, and the distributor blade having become fatigued, or the knob on its extremity worn, so that the latter does not make actual contact with the studs, this would in no way prevent the efficient working of the magneto, as the high-tension current would then be transmitted by jump-spark, though across a very small gap indeed, as immediately the knob ceased to rub the nickel studs, there would be no more friction, and the gap would not be widened.

We know by experience that this gap only affects the magneto in that it makes starting slightly more difficult. To overcome this only takes a few seconds for either replacing the blade or bending out the existing one.

Faithfully yours,
J. LACOSTE AND CO.,
Jan. 29th. R. A. Cheswright.

THE FLYING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Replying to the letter of Mr. A. V. Roe, although I should have liked to comply with his request for an illustration, in view of the fact that the principle of my machine is an entirely new one, I can hardly disclose the idea before it is protected not only in Great Britain but abroad. Mr. Roe overlooks in taking up the brief for the aeroplane the great primary and initial difficulty with all aeroplanes, viz., starting from the ground. There is also a much less difficulty, but one that must be considered nevertheless, viz., the alighting on return to earth without undue velocity. This will necessarily arise, although we do not hear much of this difficulty from the Wright Brothers or the other experimenters. A bird always turns its spread tail downwards just before alighting, to arrest its motion. Something similar to this action is necessary. A small double aeroplane that I released from a kite on Wimbledon Common in 1894, although very lightly constructed of bamboo and paper, came down with such velocity, although travelling in a line not more than 10 or 12 degrees from the horizontal when it reached the earth, that the bamboo frame was smashed.

What is required is an apparatus that will lift vertically or nearly so for a certain distance, before bringing the equivalent of the aeroplane into action. Then the two should operate together, the former controlling and guiding the erratic tendencies of the latter.

An aeroplane will only be usable, whatever the success and skill eventually attained with it, in a treeless and houseless country. The sand dune, in fact, is the best ground for the use of the aeroplane, and sand dunes are not everywhere obtainable. The simple aeroplane, it is obvious, could not be used in, or in the neighbourhood of, a city for instance, and its use will be very limited if it is usable only on land bare of every obstruction, such as trees or houses. The insurance premium on the lives of passengers of an aeroplane proposed to be operated in the neighbourhood of trees would, I believe, be prohibitive.

My principle is one that admits of complete control and dirigibility of the whole machine. Even in the small model this was sufficiently proved to my satisfaction, as I could set it to travel at almost any angle with the wind, and I am confident that on this principle the controllable, useful and commercial machine will come when it comes. I believe that even the eagle has some little difficulty in rising from level ground. I do not know whether the albatross has a like difficulty, but I should imagine it would have. An albatross might find a little difficulty in getting out of St. Paul's Churchyard, for instance. A commercial aerial machine must carry passengers with the same degree of safety as the train and the motor car.

Yours faithfully,
Jan. 29th. J. D. ROOTS.

WEIGHT OF MOTOR CAR BODIES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I notice in your last issue some particulars of the regulations which will be made in connection with the Circuit Européen. If it is not too late, I should like to protest against the unreasonable weight which is going to be fixed as a minimum for the carriage body work. It seems to me that in a costly trial of this description every effort should be made to embody in the rules regulations which will be practicable, and which will give information and guidance to the constructor of motor vehicles as well as to the general public.

I take it that most of the competitors will be representatives of motor car builders, and those who enter, and go through the trial successfully, will necessarily expend a very considerable amount of time and money. Under the circumstances, I think that as the weight of carriage bodies to-day is a matter demanding very careful consideration, it will be an excellent opportunity—as the course is a long one—of obtaining data as to the behaviour of the carriage work quite as much as the mechanism forming the chassis. I consider that a limousine body to carry five people in the back, with the parts specified in the draft rules, should not weigh more than 6½ cwts. at the outside, whereas a minimum of 8·84 cwts. has been apparently decided upon. Now that the public demand is in the direction of much longer wheel bases, and more luxurious body work, tyre troubles are becoming a serious question. Under the circumstances, it would surely be a step in the right direction if our carriage builders took advantage of this trial to see what could be done in the way of building a strong, serviceable, and yet light carriage body. I personally believe that there is a very great deal yet to learn in this connection, and should like to see the rules framed so that a maximum instead of a minimum weight of carriage body were fixed, considerably lower than the figures already specified, and a thorough examination made into the condition of the body both before and after the trial.

Some little time ago I saw a paragraph in one of the papers that the firm of Michelin and Company were proposing to offer a prize for a competition in motor carriage bodies, owing to the fact that they were becoming so heavy that the tyres were suffering in consequence. I have personally seen examples of what I consider unnecessarily heavy carriage work from some of our leading coachbuilders, and I think that we should take advantage, if possible, of this opportunity in settling a reasonable maximum for the weight of various standard bodies.

My firm are entering for this competition, and as we shall build our own carriage bodies we should like to obtain from the trial all the data possible relating to the dimensions, shape and weights of the body work, as well as the rest of the car. The majority of the measurements specified seem fairly satisfactory, with the exception of the height of the roof from the frame. I think this dimension should not exceed 5 ft., whereas 5 ft. 3 in. is specified. Some latitude should be allowed in the direction of measurements as well as in the weight of the carriage work, so as to obtain each maker's idea as to what he considers the best.

The question as to how the marks should be awarded could be arranged without any difficulty, as, if a competitor runs with a very light body, which during the trial shows signs of weakness, marks could be deducted, which would put him quite on a level with the competitor who had embodied substantial carriage work in his car.

As I consider that this contest is likely to be a very important one, I should like to hear what your readers have to say on this point, and, thanking you in anticipation for inserting this letter,

I remain,
Yours faithfully,
THE AUSTIN MOTOR COMPANY, LIMITED.
Jan. 30th. H. Austin, Governing Director.

FOUR CYLINDERS AND SIX CYLINDERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—My challenge to test the comparative merits of 6-cylinder and 4-cylinder motor cars has elicited two possible acceptances, from Mr. Claude Johnson and Mr. S. F. Edge, respectively. The former does not think that a speed contest would settle the matter. For my part I am quite willing to take into account, not merely speed over the whole course, but also hill-climbing powers, speed on the level without changing gear ratio, petrol consumption, smoothness of running, &c.

Mr. Claude Johnson's suggestion that "the jury should consist of three ladies and three gentlemen who have been in the habit of driving in carriages drawn by horses, and who are not wedded to any particular form of motor traction," is, in my opinion, undoubtedly the weakest possible. On the other hand, I am prepared to accept the verdict of experts, and people who have had practical experience of motors generally, rather than that of persons who know nothing, or next to nothing, about them. One might as well ask naval officers to adjudicate on technical matters connected with cavalry.

I am very pleased to note that my friend, Mr. S. F. Edge, is ready to have a friendly match with me. I am also prepared to go to the Continent and have the match there, but not with a racing car. I consider that the match should be with *bona fide* touring cars, as sold to the public. I know this will open up a fresh discussion as to what is a touring car and what is a racing car. I think this has been solved by the Automobile Club of France, who recently, I understand, decided that cars with greater engine capacity than four cylinders of 130 mm. bore could not take part in the "Circuit Européen."

According to Mr. Edge's reply to my letter, I am under the very strong impression that the 6-cylinder car which he proposes to match against my 4-cylinder car, is undoubtedly a racing car.

As regards the test for silence, this is a very difficult one to carry out, whilst wear and tear of machinery may be left out, for I do not think for one moment that any car that would take part in such a test would be so badly constructed as to show any wear and tear of machinery. As to the wear and tear of tyres, a great deal depends upon the way the car is driven, and the type of clutch. Petrol consumption would be most interesting, also hill climbing and speed on the level with same gear ratios. As regards the slow running on top speed, and running say 500 miles without changing speed, I do not attach much importance to them, as I consider that in order to obtain the maximum horse-power at the road-wheels under all conditions, it is essential to have gears with suitable ratios.

I am not in any way prejudiced, and am quite prepared to advocate 6-cylinder cars in place of four, if cars of that type demonstrate to me their all-round superiority to cars of similar horse-power with four cylinders.

I am, Sir, Yours faithfully,
January 25th, 1906. H. H. P. DEASY.

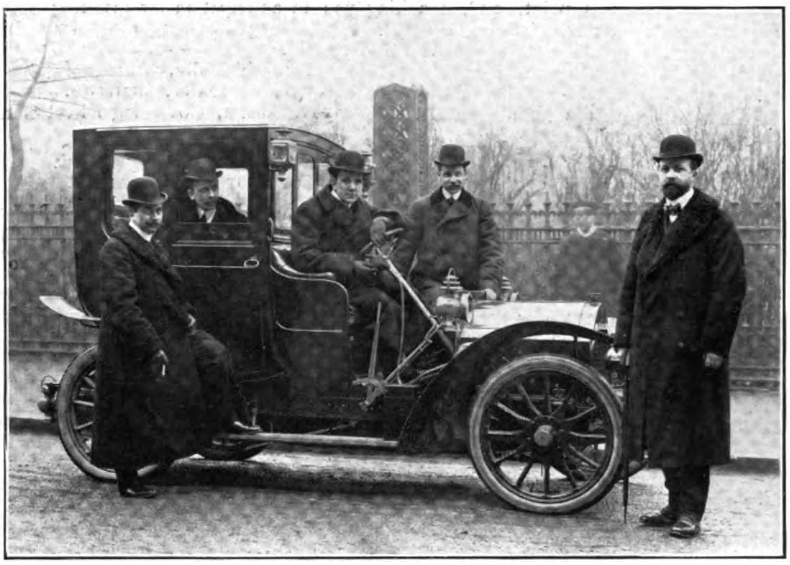
* * * *

Free Inspection of Argyll Cars.

WITH reference to the form for their periodical report which Argylls, London, Limited, have prepared, and to which we referred last week, we learn that this has been copyrighted at Stationers' Hall.

Newcastle-on-Tyne Exhibition.

THE first list of exhibitors at this Show, which will be held February 9th to 17th, in the New Exhibition Hall, St. Mary's Place, includes most of the leading British cars and many of the best-known foreign makes, in addition to one or two motor boats. The Exhibition is under the patronage of the Right Hon. the Earl of Scarborough, Lord Armstrong, Lord Berwick, and many other distinguished personages. Five per cent. of the gate receipts will be given to local charities. Success should be assured for exhibitors, as every motor and allied trader will receive an invitation and free ticket. In addition ten thousand special complimentary invitation tickets will be sent to magistrates, solicitors, doctors, &c., that is, all likely buyers of a motor car in the north-eastern district will receive a free ticket. Also any member of the Motor Union will be admitted free to the Show on production of his membership card. The band of H.M. 1st Life Guards has been specially engaged.



An interesting group of motorists photographed by us one day last week near Regent's Park. Mr. Charles Jarrott at the wheel, and Mr. W. M. Letts, standing on the left, are readily recognised. The other automobilists in the picture are Baron de Turckheim, M. Turcat, and M. Mery, who are so well known in connection with the celebrated De Dietrich Cars.

An Amazing Piece of Law.

SIR RALPH LITTLER, K.C., Chairman of the Middlesex Sessions, on Saturday last laid down the rule (it is thus described by the daily papers, but we should prefer to say, "uttered the astonishing opinion") that "the motor car on the highway occupies the same relation to slower vehicles that a steamship does to sailing vessels at sea." "A motor car," he said, "must give way to slower vehicles." We should very much like to know where Sir Ralph Littler obtains justification for his pronouncement. There is nothing of the sort in the Highways Act, nor in any of the Acts which have regulated road traffic since. The steam vessel at sea gives way to the sailing vessel—and it is, we believe, an ordinance of maritime law that it should do so—because the sailing vessel has to tack, and if she were interrupted in changing from one "leg" to the other when, as sailors say, she is "in stays," the consequences might be disastrous. But there is nothing of the kind with the slower traffic on the road, whether horse drawn or otherwise. The pronouncement, in fact, is sheer nonsense, and Sir Ralph Littler had no more justification in making it than if he had announced his profound conviction from the Bench that the motor car has no right on public highways at all.

Cowled Chauffeurs.

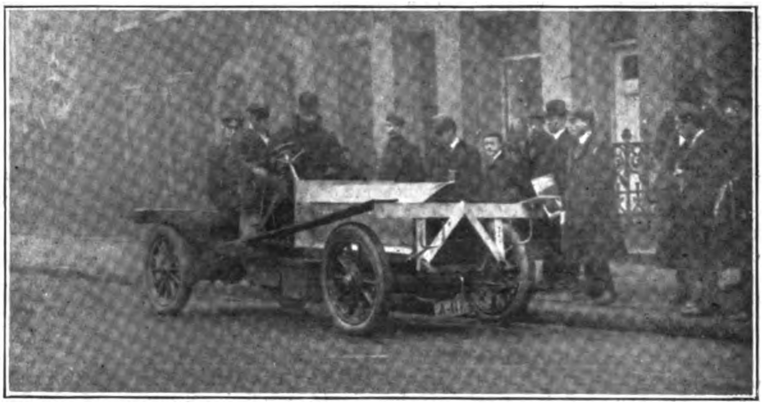
JUST as in the Middle Ages the church accommodated itself (with difficulty) to the theory that the earth goes round the sun instead of the sun round the earth, so it is now beginning gradually to recognise and appreciate the automobile, and the monks of the famous hospice on the Great St. Bernard who have been so long and justly famous for their exploits in saving snow-drifted travellers and tourists, are about to adopt the *rôle* of chauffeurs. We referred some time ago to the arrangements being made for transporting supplies from Valais to the great monastery. There has been some difficulty in obtaining permission, but that has now been got over and cars specially constructed to surmount the steep gradients encountered on the road, are being built and are to be driven by the monks, who will preserve their medieval cowls on the modern motor vehicles which they drive.

An Attractive Load for the Motor 'Bus.

THE motor 'bus is a general favourite with Londoners just at present, but to Miss Kate Cutler, of the Gaiety Theatre, must be accorded the palm of smartness for recognising its adaptability and the advantages of its roominess for carrying out the quick change of costume between one theatre and another which artistes who have had to appear on different stages in different characters on the same evening have hitherto usually carried out in the private brougham or the homely growler. Incidentally, too, no doubt the passage through the streets of a motor 'bus be-curtained and arranged (also placarded) as an actress's dressing-room could not fail to impress the popular imagination in the enterprising and charming actress's favour. One of the "Vanguard" 'buses which had previously been plying between St. John's Wood and Victoria, was accordingly transmogrified in the manner described, and one evening last week it awaited Miss Cutler at the Gaiety Theatre, conveyed her at 9.30 thence to the Palace Theatre, where she took her part in "Hero and Heroine," dressing for the part in the 'bus on the way, and afterwards returned to the Gaiety, where at 10.35 she was enjoying an impromptu meal on the stage at the "Crimson Butterfly" Restaurant.

The Institute of British Carriage Manufacturers.

MR. ARTHUR F. MULLINER has been elected President of the Institute of British Carriage Manufacturers.



Baron Turckheim, of the De Dietrich Company, together with M. Turcat and M. Mery of the same firm, have been paying a visit of inspection to England, and have been having a good look round several of the leading factories, *en passant*. Amongst these was the Napier works, where the visitors were particularly interested. In addition, Baron Turckheim availed himself of the opportunity of having a run with Mr. Cecil Edge on a 6-cylinder Napier. The snap which we are able to reproduce above, is a record of this interesting little episode. That the ride was an unexpected one, may be gathered from the temporary mudguards and their methods of fixing, which were adopted for the occasion.

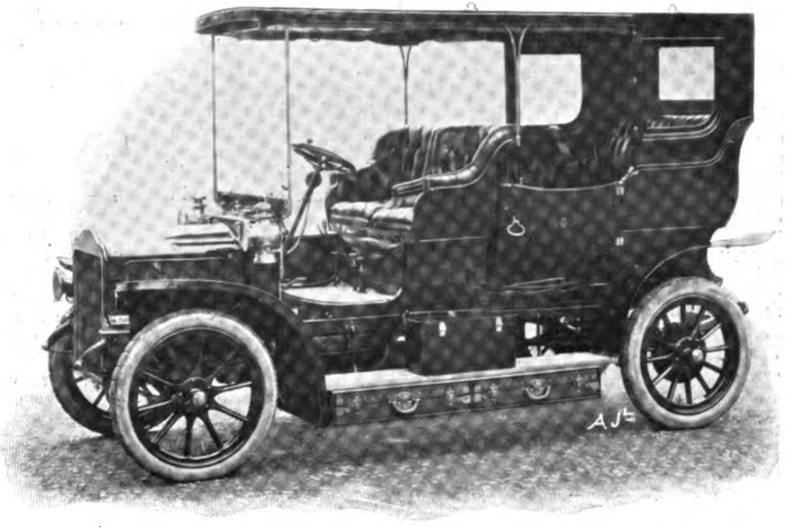
COMMERCIAL POINTS.

Motors for Ambulance Work.

FOR some time past the Council of the St. Andrew's Ambulance Association in Glasgow have had under consideration the question of pressing the petrol motor into their service. The question, naturally, demanded careful and critical examination, as the first essential for an ambulance vehicle is that it shall not be easily liable to breakdown or other derangements. After weighing up the pros and cons, and examining the designs and mechanical details of a number of leading makes, we learn that the council have placed an order with the Argyll Company for a 16–20-h.p. chassis with specially-designed body. In the internal arrangements of the vehicle a number of modifications will be introduced to suit the special work, largely on the initiative of Mr. A. T. Reid, of Hyde Park, and Colonel H. J. Barnes, R.A.M.C., secretary of the Association.

THE 6-cylinder Napier car, driven by Mr. Clifford Earp, which has made such splendid running at the Florida meeting, was, we learn, fitted with "Castle" accumulator and "Castle" distributor coil, both being standard models.

WE learn that H.M. The King's latest car has been fitted with the new pattern Continental tyres of a specially large size of the non-skid pattern. The car, which is fitted with a powerful engine, has a heavy covered-in carriage body, and consequently a great strain is thrown upon the tyres, and in view of the fact that a carriage for the use of the King must necessarily be as free as far as possible from tyre troubles, the selection of the Continental tyre is a compliment to the manufacturers, worthy of notice.



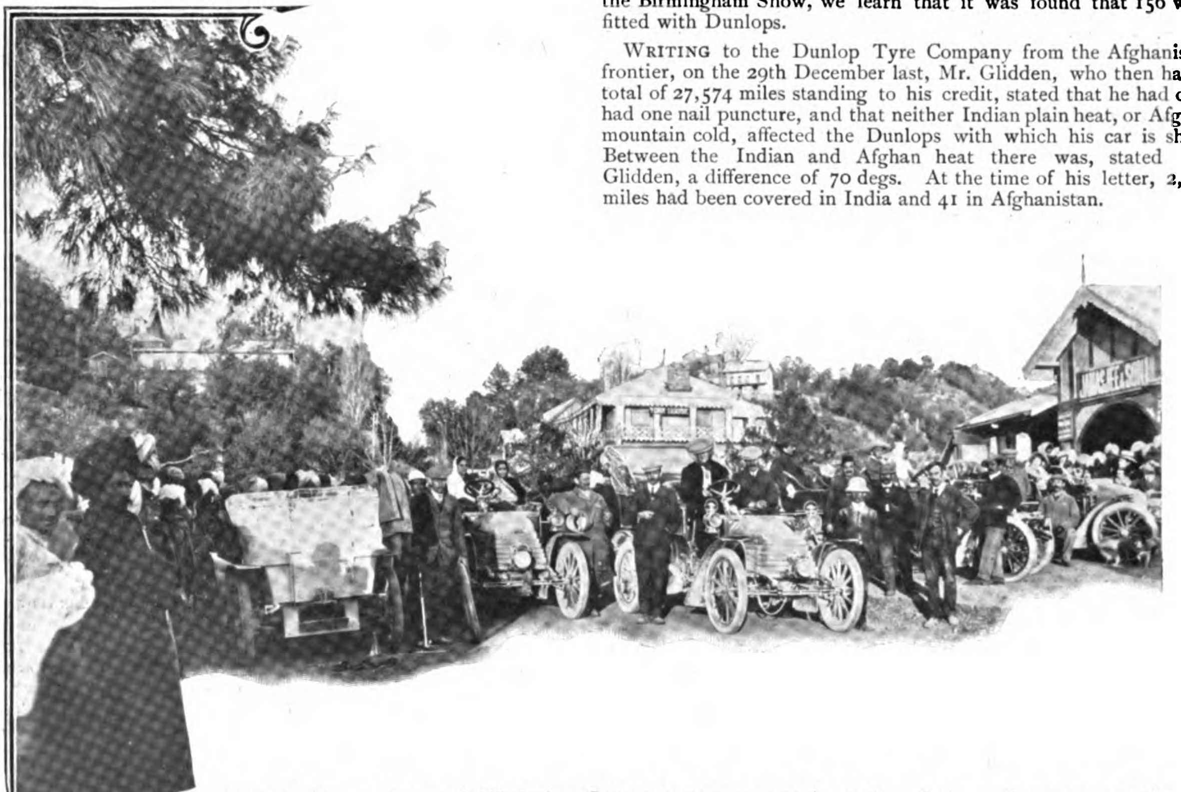
A BEAUTIFUL STEAM CAR.—One of the most recently produced White Steam Cars, which has just been completed to the order of the Duchess of Manchester.

SIRDAR tyres are being fitted to the new State carriages of Their Majesties the King and Queen of Norway.

MR. J. W. ADAMS, Messrs. Humber's sales manager, is leaving on an extended tour round the world, calling upon many of the numerous foreign agents of Humber's who have not previously been visited by a representative of the firm.

As the result of a count of motor tyres fitted to cars exhibited at the Birmingham Show, we learn that it was found that 156 were fitted with Dunlops.

WRITING to the Dunlop Tyre Company from the Afghanistan frontier, on the 29th December last, Mr. Glidden, who then had a total of 27,574 miles standing to his credit, stated that he had only had one nail puncture, and that neither Indian plain heat, or Afghan mountain cold, affected the Dunlops with which his car is shod. Between the Indian and Afghan heat there was, stated Mr. Glidden, a difference of 70 degs. At the time of his letter, 2,433 miles had been covered in India and 41 in Afghanistan.



Very large numbers of Wolseley Cars are now in use in India, their performances in the Delhi-Bombay, Bengal, and other trials having brought them into great prominence. In nearly all combined excursions of motorists in India, one or more of this type of car are included, and our picture shows an excursion which was made to Muree, a Punjaub Hill Station, situated 7,500 feet above the sea level. **The party was organised by Mr. Lalakka, of Bombay, and included:—Mrs. Mansfield (wife of General Mansfield), Major Warren, Captains Shuttlebrook, Fitzgerald, and Williams, Lieut. Wood, Mr. Dhonjibhoy, C.I.E., Mr. and Mrs. N. J. Jamasjee, Dr. and Mrs. Setna, Mr. and Mrs. Boga.**

Arrol-Johnston Extensions.

MUCH additional machinery of the most approved description having been recently laid down at the works of the New Arrol-Johnston Car Company, Limited, Paisley, Scotland, has enabled this progressive firm to greatly increase their facilities for the output of their popular cars and commercial vehicles. In connection with the Company's extensions, a large building belonging to the firm, hitherto unoccupied, is being fitted up as a running and repair department, so as to relieve somewhat the pressure on the main premises.

THE Scottish Motor Engineering Co., Ltd., of Granton Harbour, Edinburgh, have been appointed official repairers to the Automobile Club for the district. The Company inform us they have fitted up special repair shops to meet the requirements of owners of every type of car, and keep a special staff of men on the premises for this purpose.

Turin Motor Exhibition.

AMONGST the British firms whose cars will be represented at this important Show, opening on Feb. 3rd, will be Argyll Motors, Ltd., who will stage two of their most popular types of cars. One of these is a 10–12-h.p. 2-cylinder side-entrance car, and the other a 16-20-h.p. 4-cylinder. These cars will be shown in the stand of the Société Anonima Garage Croizat, the Argyll Co.'s agents in Turin. We are informed that "Argyll" cars are selling readily in Italy, there being now a large and increasing number in use in the country, and more particularly in the North.

* * * *

LEGAL INTELLIGENCE.

"Motor Schools"—More Alleged Frauds.

RISKI MEDAWAR, 22, a Turkish subject, described as a motor car dealer, and John Raymond Kerr, 21, of Warwick Gardens, West Kensington, two well-dressed men, were on January 26th, at Westminster Police Court, charged on warrants with conspiring to obtain sums of 4 guineas and other sums by false pretences and fraud. It is alleged that they obtained money from a number of young men who were induced by advertisements and circulars to apply for motor car instruction at 47, Victoria Street, and Cartaret Street, Westminster.

Evidence of prisoners' arrest was given by Detective Cock, who said that many young men had lodged complaints of having been defrauded. Medawar remarked, "They will have to prove that it is a fraud." Kerr said nothing. Prisoners were remanded in custody.

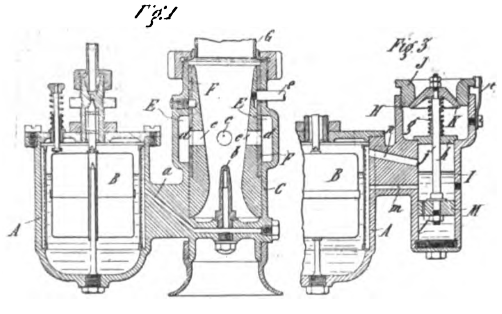
* * * *

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

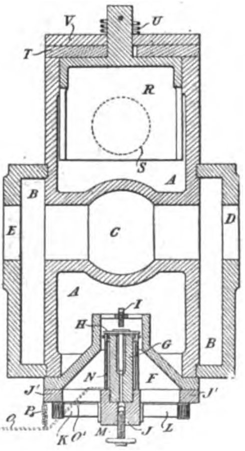
20003. 3rd October, 1905. Improvements in Air Carburetting Apparatus for Internal Combustion Motors. Georges Richard, 108, Rue St. Maur, Paris. Date under International Convention 10th October, 1904. The feature of this invention is that the stem of the valve which allows the passage of supplemental air, carries a piston which acts as a controlling brake in being displaced in a liquid which passes from the one side to the other of this piston through an orifice of small section formed through the piston, thus constituting a dash-pot device. There are four figures. Fig. 1 is a vertical section. Fig. 3 is a part vertical section. The reservoir, A, with constant level has a float, B, the coned stem of which acts as a valve for the admission of the liquid supplied. The channel, *a*, communicates with the nozzle, *b*, situated at the centre of the chamber, C, through openings of which the external air enters. There is thus formed at the height of the nozzle a gaseous mixture to which is added the air admitted through the openings, *c*, to an annular channel, E. A cylindrical slide, F, having holes, *d*, of the same section as the openings, *c*, enables the openings, *c*, to be more or less closed or opened by turning the slide by the rod, *e*. The tube, G, conducts the gaseous mixture to the motor. The annular channel, E, for the admission of the supplemental air communicates through a passage with a vessel composed of an upper larger part, H, and another cylindrical part, I. The part, H, has screwed into it the seat, J, of the valve, K, for the admission of the supplemental air. On the underside of this valve is a spring, *g*, which tends to raise the valve against its seat. This spring bears, on the other hand, upon the cap, *h*, which separates the part, H, from the cylinder, I. By screwing the seat, J, more or less into the part, H, the tension of the spring which acts under the valve is regulated, the seat, J, being secured in the position imparted to it by means of a spring-catch, *i*, which engages in notches formed in the periphery of the seat, J. The stem, *j*, of the valve, K, passes loosely through the cap, *h*, into the interior of the cylinder, I, where it carries a piston, M, having a small passage, *l*. Two channels connect the vessel, A, with the cylinder, I; the one, *m*, is situated below the level of the liquid in the vessel, A; the other channel, *n*, connects the space above the liquid, so that there exists an equilibrium of pressure in A and in I. The suction-action of the motor acts through G *c* E. The spaces above the liquid in A and I are necessarily open to the suction, as if they were closed vapour pressure might accumulate, preventing the liquid in A from being maintained at the proper level. The liquid in the dash pot being the same as that fed into the apparatus, it will always be renewed, so that it is not subject to thickening after a time.—January 10th, 1906.

Fig. 1



1035. 19th January, 1905. Improvements in Carburettors for Oil Engines. Hedley S. Moorwood, Glenwood, Dore, Sheffield, and James F. Bennett, Gordon Cross House, Dronfield, Sheffield. The main object of this invention is the construction of a simple apparatus for producing a combustible mixture of air and hydrocarbon oil of high-flash point. Apparently, therefore, the title should have been "Improvements in Vaporisers for Oil Engines." There are seven figures. Fig. 1 is a vertical section. A is the vaporising chamber, having around it a jacket, B, through which the exhaust from the engine is passed. C is a passage extending across the interior of the chamber, A, through which the exhaust gases are also passed. This passage is enlarged at the centre into the form of a hollow ball. The exhaust gases are led in at the opening, D, and leave at E. At the bottom of the vaporising chamber is an air inlet passage, F, contracted at the top into a cylindrical opening within which is held a disc sprayer of somewhat less diameter, so that air on entering rushes through the narrow annular space left between them. The sprayer is formed of a disc at the top of a fixed stem, G, and a loose disc, H, resting above. The stem, G, has a central oil supply passage bored through it, and a stem projecting downwards from the upper disc fits loosely within the upper part of this passage, whilst its lower end serves as a valve to close the oil supply unless the upper disc is raised. A fine film of oil is left between the two discs ready to be sprayed as soon as the suction of the engine takes place. The lifting of the sprayer opens the valve and acting as a pump draws up a further supply of oil. I is a stop to limit the lift of the disc, H. The stem is secured at the bottom to a boss, J, carried by radial arms from a ring, J¹. The oil passage in G opens at the bottom into a corresponding passage in the boss, J, to which oil is supplied through one of the radial arms. Paraffin is supplied through an inlet supply pipe, K, and petrol through a supply pipe, L. This allows of petrol being used when starting and paraffin when the apparatus has become fully heated. M is a screw stop valve by which the supply of oil can be cut off or controlled. When starting the engine provision is made for holding up the disc, H, at this time by placing around the stem, G, a tube, N, having two pins projecting upwards from it to come below the disc, H, and lift it when the tube itself is lifted. To lift the tube a lever, O, turning on a fulcrum at O¹ is used, the lever being normally held out of action by a spring, P. R is a throttle by which the outlet, S, can be partially or entirely closed. The stem is held up by the action of a spring, U. The spring bears downwards upon a disc, V, placed above the cover, T. The cover, T, disc, V, and throttle valve, R, are all slotted, so that when desired air may be admitted through them to the vaporising chamber.—January 10th, 1906.

Fig. 1.



Patent Specifications Published.

Applied for in 1904.

Published February 1st, 1906.

26,965. A. G. RAMAGE AND G. MACMILLAN. Spring wheel.

Applied for in 1905.

Published February 1st, 1906.

478. O. H. M. BEYER. Driving pulleys for motor cycles.
503. H. TECHEL AND M. SALASCHEK. Valve gear.
2,792. W. H. BARRETT AND C. CARDELL. Intl. combn. engines.
2,966. W. H. HARDY. Intl. combn engines.
3,071A. N. W. BUDDICOM. Carburettors.
3,257. G. H. SKINNER. Carburetting apparatus.
3,407. A. EVENO. Carburettors.
4,292. C. BINKS. Carburettors.
4,573. E. BUISSON AND F. RENARDY. Starting gear.
5,466. R. G. FOOT. Driving gear.
5,467. C. HEIRONS. Spring frame.
5,500. C. MERINGTON. Driving gear in motor cycles.
6,404. S. E. ALLEY AND D. H. SIMPSON. steering wheels.
6,445. C J. MAYHEW. Variable speed gearing.
10,519. C. MARSTON, W. HOUGH, AND C. PINSON. Speed gears.
13,115. R. RATCLIFFE. Towing arrangements.
14,276. C. B. ROBINSON AND G. MOLE. Carburettors.
15,523. C. A. CARLSON. Intl. combn. engines.
18,832. L. MACQUAIRE. Sparking plugs.
19,621. SOC. FALCONNET-BERODEAUD. Tyres.
21,414. J. M. ROSS. Variable speed gear.
22,888. W. E. ROWCLIFFE. Wheels for motor omnibuses.
23,194. C W. THORNYCROFT AND H. S. YOXALL. Brakes for motor cycles.
23,286. J. G. CAREW-GIBSON. Weather shields.

The
AUTO MOTOR
(YELLOW COVER). JOURNAL
A Record and Review of Applied Automatic Locomotion.

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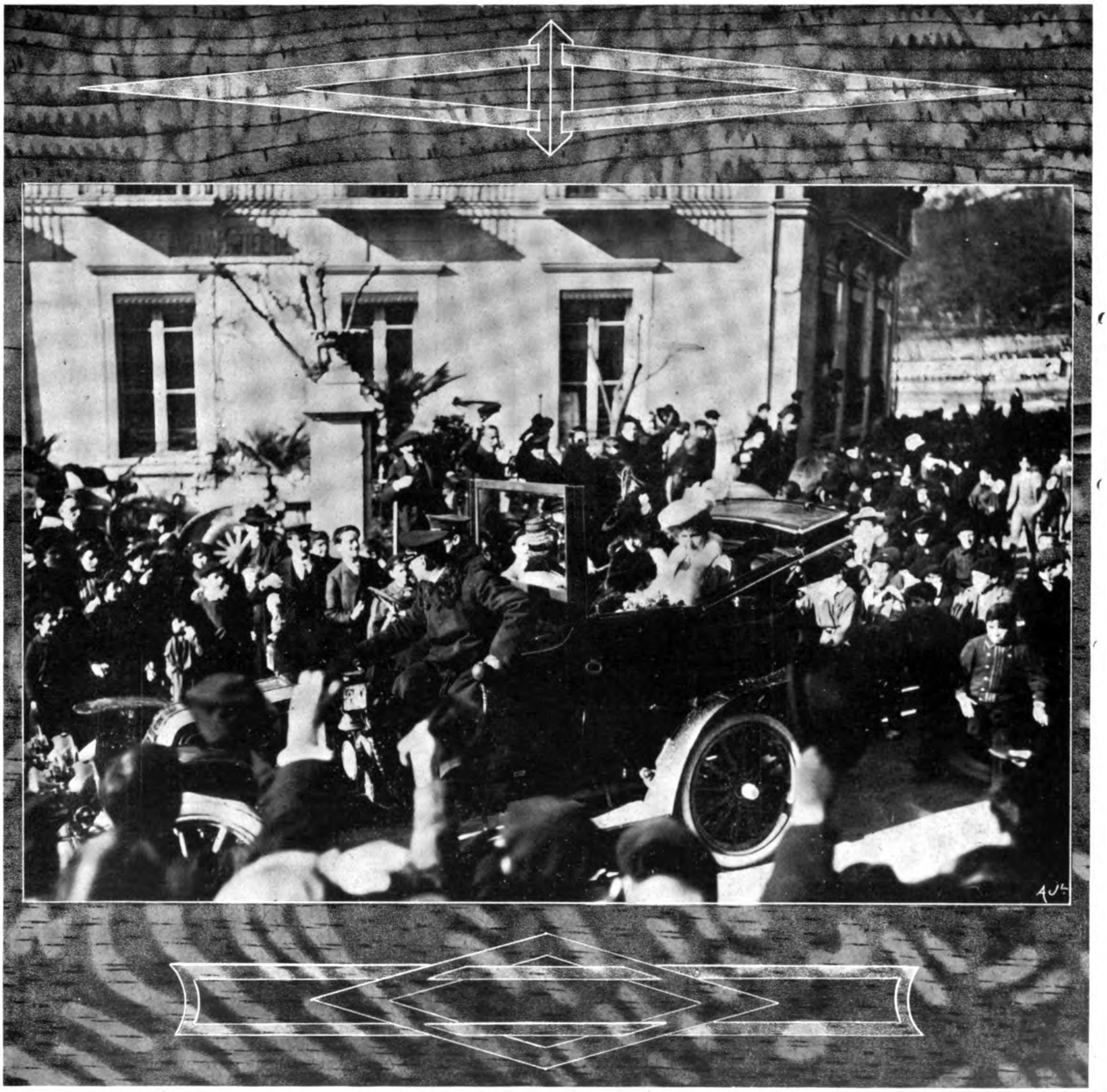

PRINCESS ENA OF BATTENBERG AND THE QUEEN MOTHER OF SPAIN DRIVING THROUGH THE STREETS OF SAN SEBASTIAN IN THEIR MOTOR CAR.—The splendid enthusiasm of the populace upon every occasion promises well for the future happiness of the beloved Princess, as Queen of Spain.

C

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C, by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

Feb. 9–17 ...	Manchester Motor Show.
Feb. 9–17 ...	Liverpool Motor Show.
Feb. 9–17 ...	†Newcastle Motor Show.
Feb. 10 ...	Tri-car Hill-Climb, River Hill (Lewisham A.C.).
Feb. 19 ...	Scottish A.C. (Western) Annual Dinner.
Feb. 22 ...	Ladies' A.C. General Meeting.
Feb. 22 ...	"A Try for the Herkomer Cup." Paper by Mrs. G. Manville (Ladies' A.C.).
Feb. 23–Mar. 3.	†Manchester Motor Show (St. James's Hall).
Feb. 26 ...	*4,000 Miles Tyre Trials.
Feb. 26 ...	*Lamp Trials.
Feb. 26 ...	*Speedometer Trials.
March 8 ...	A.C.G.B.I. General Meeting.
March 2–10 ..	†Sheffield Motor Show.
March 9–17...	†Glasgow Motor Car Show.
March 24–31	Cordingley and Co.'s Motor Show.
June 11–16 ...	Lands End to John O'Groat's (Auto Cycle Club).
June 13–16 ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
Aug. ...	*Van Trials.
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

Feb. 3–18 ...	Berlin Motor Show.
Feb. 3–18 ...	Turin Automobile Show.
Feb. 19–25 ...	Paris Voiturettes and Tri-car Trial (*Les Sports*).
March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
April 1–17 ...	Budapest Exhibition (A.C. of Hungary).
April–May ...	Milan Exhibition.
April ...	Paris Voiturettes Trial (*L'Auto*).
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PASSING EVENTS.

Cars of To-day, and How to Recognise Them.

Most people, whether deeply interested in the automobile movement or not, like to know the build of cars that pass them on the road or in the street. With a view to rendering recognition of the principal types of vehicle as easy as possible, we this week commence a series of specially-arranged illustrations, under the heading of "Cars of To-day, and How to Recognise Them," which will be found to give the salient and characteristic features of the leading types and builds of present-day automobiles—including not only pleasure vehicles, but also such familiar objects in our streets as town vehicles and motor 'buses. Each of the leading makes or types is dealt with separately, and an indication is given of the various sizes in which similar types are built. On the right-hand side of the title is a small illustration of the complete car, and on the left, the country in which it is manufactured is denoted. Underneath are larger illustrations showing the most noticeable features of the vehicles in question, with arrows directing attention to them, while a short description sums up these leading peculiarities. These pages of The Automotor Journal will therefore constitute a graphic guide to practically every type of car on the market, and anyone with the exercise of a very little observation will be able to identify the build of any car at a glance.

◆ ◆ ◆

From the Heart, and Not as a Crank.

Attempts to resuscitate the "Juggernaut" in February, even such a mild February as we have had up to the present, are not likely to be very successful. It is in the sweltering dog-days, when the dust lies thick upon our highroads, that the worshippers of that monstrosity are most likely to be successful in infusing some appearance of life and vitality into his deflated carcase. All the same, the Marquis of Queensberry has made a gallant attempt to set the Juggernaut on his legs again, and it was the Marquis of Queensberry, as most of our readers will recollect, who applied in the open Court to a Metropolitan Magistrate to know if he might shoot at motorists with a pistol. Lord Queensberry is accordingly hardly to be taken as a serious personage. No, we do not think the Juggernaut will ever become a terror again, and certainly the month of February is a very unsuitable time to attempt his resuscitation. Still, Lord Queensberry must be credited with doing his best. This is what he says in a letter to the *Daily News* and other lay papers, referring to the unfortunate accidents to two children, named Ellen Broad and Thomas Snapes, who were recently killed by motor cars, in which coroners' juries found that no blame attached to the motorist:—

> In a morning paper of to-day, anent the deaths of Ellen Broad and Thomas Snapes, I find it under the following heading: "Child Runs Into a Motor. . . ."
>
> While winter was on us, and the roads were bad, where was the gentle motorist? We looked and longed again for the pleasant dust, and sniffed the air vainly for the spicy breezes, and listened hopefully for the cheerful grunt. Alas! he was at Monte Carlo taking his well-earned rest, or perhaps strengthening his nerves for the coming fray on his yacht in the Mediterranean, varied by an occasional dash ashore to sharpen up the wits of the very young and very old Continentals, or perchance in some savage land, showing to the astounded heathens (save the word!) the latest game of "hog-amok."
>
> But now, thank goodness! winter is waning. Once more the roads are drying up. Spring is knocking at the door, and all is bright and joyous, and, to crown all, the jaded motorist is back with ruddy cheeks and iron nerves, and funny oaths from foreign parts.
>
> But there is one thing mars the joyful season, and that is those abominable British children who will play marbles like we all used to in the good old days, and will go to school by the roads, as we used to in the good old days, instead of by the only safe modern way, over hedges and ditches: in fact, any d—d old way except the right one, and who will insist, as this daily tells us, on running into poor innocent motors. . . . And so the motor season commences.
>
> Good-bye, little Nellie Broad. Good-bye, little Tommy Snapes. Sleep well, you have earned better than most of us, who are older than you, your rest. Some words of that beautiful hymn, "We are but little children weak," should be your epitaph, and as sure as the sun rises, some Member of the new Government, of which I am an ardent, though voteless, supporter, will be your remaining little brothers' and sisters' champion. It was impossible to hope much from the last, as a search of the police courts will easily explain.

And he adds as a postscript, "I speak from the heart and not as a crank."

◆ ◆ ◆

Good May Result.

We are not sorry that Lord Queensberry has been stimulated into his ill-advised utterances. Except on the rare occasions when the British public loses its head, there is nothing so calculated to injure a cause in its eyes as exaggeration and unfairness. A better feeling between motorists and non-motorists is generally gaining ground as the result of the operation of causes to which we recently drew attention. One of the things most certain to prevent a recrudescence of prejudice is to find prejudice carried to burlesque extreme, particularly at a time of year when even the most prejudiced are not very angry with the motor car. Lord Queensberry, therefore, must be looked upon as having done a service to the industry rather than an injury to it. May all its enemies be as ill-advised, as unfair, and as immoderate in their language as his lordship! It is all we ask for. In fact, an effect of the kind has already been produced by Lord Queensberry's hysterics, as the *Daily News*, a day or so subsequently to the appearance of his letter, made the following very trenchant observation:—

> If he (Lord Queensberry) had taken a microscope and carefully searched the remote corners of the same newspapers that sported the lurid headline above, he would have found (in some of them) another paragraph about a child that was playing in the streets at Southwark, and was killed by a horse-drawn vehicle, but it didn't have any headline.

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The C.T.C. to Welcome Motorists.

The Cyclists' Touring Club has decided on what it terms "broadening the club's constitution." Hitherto, as everyone knows, it has been an organisation, and a very fine organisation, whose *raison d'etre* and sole occupation and business has been that of looking after and catering for the interests of the cycling tourist. It would not be exactly correct to say that its attitude to automobilism has ever been collectively hostile, but its friendship for the new locomotion, if it existed at all, has certainly up to the present been decidedly platonic in character. Not so very long ago, indeed, it was formally resolved not to admit motorists to the ranks of the club. Now, however, the club has decided on a course of action which is obviously intended to turn it into an institution designed to appeal to the touring automobilist as much as in the past it has appealed to the touring cyclist. The decision at which the Cyclists' Touring Club committee has arrived does not say this in so many words. It simply declares that steps are to be taken to "broaden the basis of the club so as to admit all tourists to membership." The expression "all tourists" does not of course specifically refer to automobilists, but pedestrian tourists are now few and far between—fewer and more far between than they used to be even when the Cyclists' Touring Club was at the zenith of its prosperity and membership. So we may be pretty sure that the Cyclists' Touring Club does not mean, by broadening its basis, merely to include pedestrians. It is automobile membership that it desires, and automobile membership that it evidently hopes to get.

◆ ◆ ◆

A Change of Attitude.

Automobilists generally will be satisfied to find that they will in future be able to reckon upon the co-operation, friendship, and support of so powerful a body, and one which possesses so admirable and far-reaching an organisation as the Cyclists' Touring Club. On certain points, the automobilists—or the bodies which represent their interests—have been in cordial co-operation with the Cyclists' Touring Club for a considerable length of time. We refer to such questions as the necessity of a universal law for the lighting of all vehicles after dark, the carrying of tail lights on all vehicles, and the important questions of highway administration, reform, and improvement, with which the Cyclists' Touring Club has cordially co-operated with the Roads Improvement Association, the A.C.G.B.I., and the Motor Union. From now on, however, we may reckon that we shall have the Cyclists' Touring Club's cordial co-operation and support on all subjects in which automobilists are interested.

◆ ◆ ◆

A Question of How Far.

How far the activity of the reformed Cyclists' Touring Club in supporting and assisting automobile interests is to be carried, is, of course, primarily a question for the Cyclists' Touring Club itself. One of the most useful directions, as far as its action in the past was concerned, has been to assist in the legal defence of cycling interests where they have been imperilled, doing, in fact, for the cyclist what the Motor Union in particular has made a speciality of doing for automobilists. We do not know whether the Cyclists' Touring Club now propose to act in the same capacity as legal advisers and assistants for prospective automobilist members. Considering the much smaller subscription required for membership to the Cyclists' Touring Club, and that the Motor Union has already established such an admirable record for the conduct and support of law cases in which automobilists have been concerned, it may possibly be as well if the principle of specialisation of function should still be retained, and that particular department still be left, in the future as in the past, to the Motor Union alone. This is, however, a matter on which we offer no opinion, and it is essentially one for mutual arrangement between the two bodies. Possibly, also, the matter of arranging tariffs with hotels—a movement of which the Cyclists' Touring Club was the pioneer organisation, and in which it performed, especially in its earlier days, such admirable service, may require reconsideration. The kind of tariff arrangements which are acceptable to the majority of touring cyclists, are not necessarily at all the same as those that suit the touring automobilist, and the general tariff established by the Automobile Club with hotel keepers who are placed on its lists, differs a good deal from the Cyclists' Touring Club tariff. Whether the Cyclists' Touring Club will adopt a modification of their tariff, or whether they could usefully arrange such matters in the interests of automobile members, is also one of the matters which must also be left for the future to decide.

A Testimonial to Importance.

In whatever way all these questions are ultimately decided, however, the recognition which the Cyclists' Touring Club is thus affording to automobilism by its proposal to identify itself with automobile interests cannot be regarded as anything but providing a very telling recognition of the immense growing importance of the automobile movement. It has been our pleasing duty to have to call attention, when summing up the events of last year, to the important evidence of the diminution of prejudice against the new locomotion which the history of last year provided. The new departure of the Cyclists' Touring Club is evidence of the further spread of the same spirit of tolerance. Some years ago cyclists were one of the classes of the community most bitterly opposed to automobilism. That the leading cyclist organisation should not only be willing but should practically be compelled to join forces with the motor car interest is in itself something of a phenomenon and the best possible evidence of the growth of a general friendlier feeling and a recognition of the growing importance and power of the automobile interest. Had the Cyclists' Touring Club taken this step earlier in the day, their action would have been even more keenly appreciated by the motoring community at large than it is now, for then there could have been no question as to the value of their co-operation. As it is, however, most of those to whom they now propose to appeal will feel that it is a case of "better late than never," but that it remains to be seen how far the Cyclists' Touring Club can establish itself as an automobile "power" in the land.

⊕ ⊕ ⊕ ⊕

Marked "Dead."

THE above title represents the present condition of the Bill for promoting the motor car road from Croydon to Patcham, near Brighton. As will be remembered, the preliminary examination before the Standing Orders Committee was adjourned for a week. When the subject came up again on Monday for further proceedings, the Parliamentary agents of the promoters announced that the said promoters did not intend to proceed with the Bill this session. We think the promoters have displayed distinct wisdom in coming to this decision, and we are thankful that what we have always regarded as a menace to the automobile movement is for the present, at any rate, defunct.

What is a Walking Pace for a Motor Car?

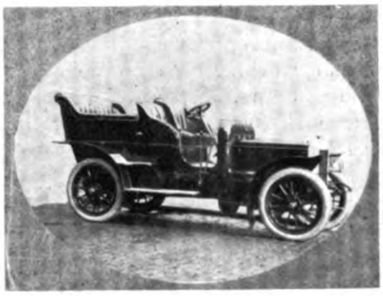
ACCORDING to the bye-laws of Northumberland, a vehicle proceeding at more than a walking pace must be furnished with two front lights after dark. A motorist was summoned for having only one of his front lights burning. Thereupon the solicitor pointed out that the bye-law was obviously framed with a view to horse-drawn traffic only, in which case the pace would, of course, be judged by whether the horse was walking or trotting. The solicitor asked the magistrates when they would consider a motor car going at a walking pace, and when it should be considered as going faster than a walking pace. The magistrates found the riddle too much for them, and dismissed the summons, suggesting at the same time to the County Council that the bye-law should be revised.

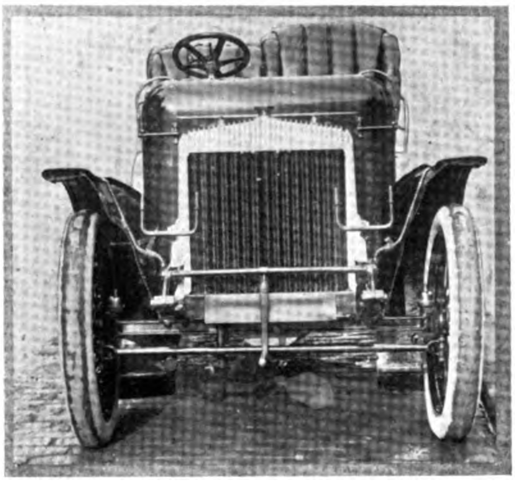
How to Recognise the Cars of To-day.

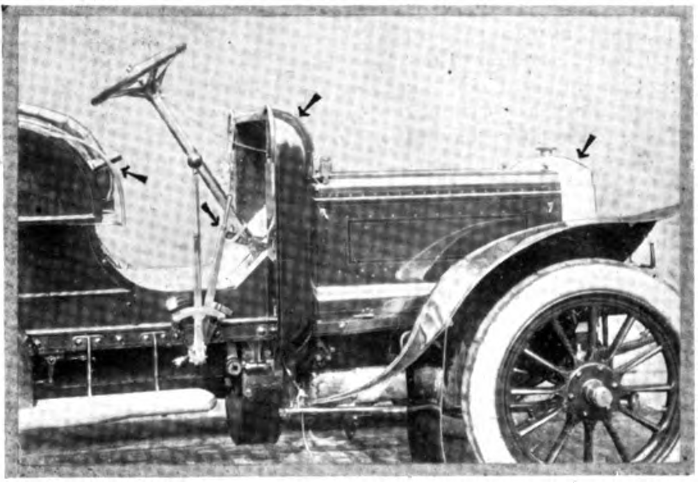
The Daimler

(BRITISH CARS)

28 H.P., 35 H.P., & 45 H.P.





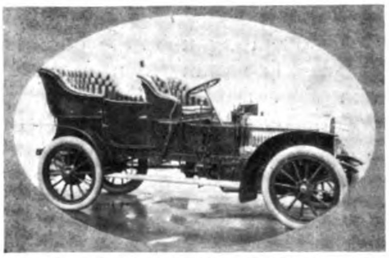


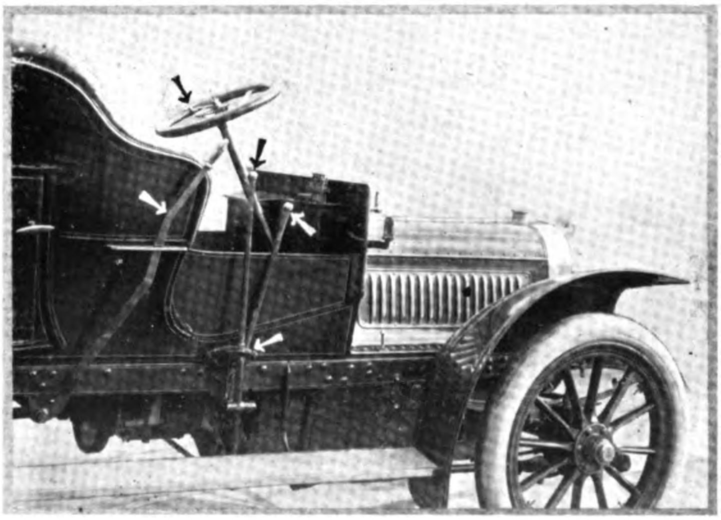
All Daimler Cars—built at Coventry—are chain driven and high-powered vehicles of large size. Their most noticeable features are the ALUMINIUM CASING ROUND THE RADIATOR, and the CURVED DASH—the latter is often copied, however, in other vehicles. Other characteristic details are the BRAKE LEVER (projecting from the side of the driver's seat), and the independent reversing lever. (See "AUTOMOTOR," Vol. X., Nov. 18th, 1904).

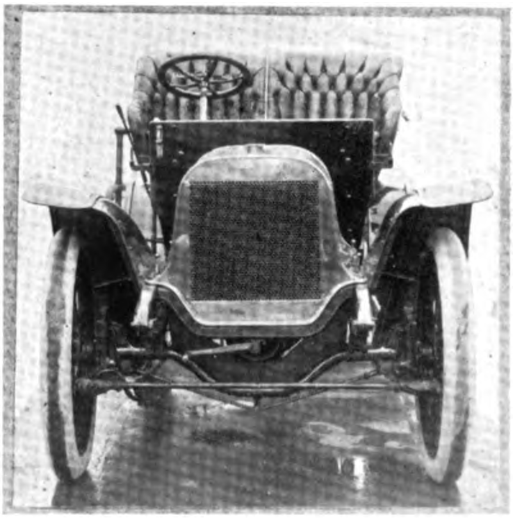
The Argyll

(BRITISH CARS)

10-12, 16-20, 20-24, & 24-30 H.P.







Argyll Cars—which are made in Scotland—are alike in their leading external characteristics, except that they vary considerably in size—and are of the "live" axle type. Peculiar to all are the RADIATOR, with its TUBES ARRANGED IN THE FORM OF A SQUARE, and the distinctive CURVATURE OF THE BONNET. The most noticeable details, however, are the CHANGE SPEED AND BRAKE LEVERS. (See "AUTOMOTOR," Vol. X., Oct. 14th to Nov. 4th, 1905).

THE 3-CYLINDER "NATIONAL" CAR.

SEVERAL important improvements have been made in the all British 3-cylinder car, which is built at Gainsborough by Messrs. Rose Bros., and for which Messrs. Lamb Bros. and Garnett are the sole agents, since it was last described in these columns,* and we are now able — with the assistance of photographs —to give some particulars concerning these new features. Being the only firm, so far as we are aware, to have restricted their attention hitherto to the production of a 3-cylinder type of vehicle having a vertical engine, the "National" car built by them is all the more interesting; it, in fact, stands to-day as one of the chief champions of the triple-cylinder principle—a principle which aims at inexpensive production combined with the advantages of multiple cylinder construction.

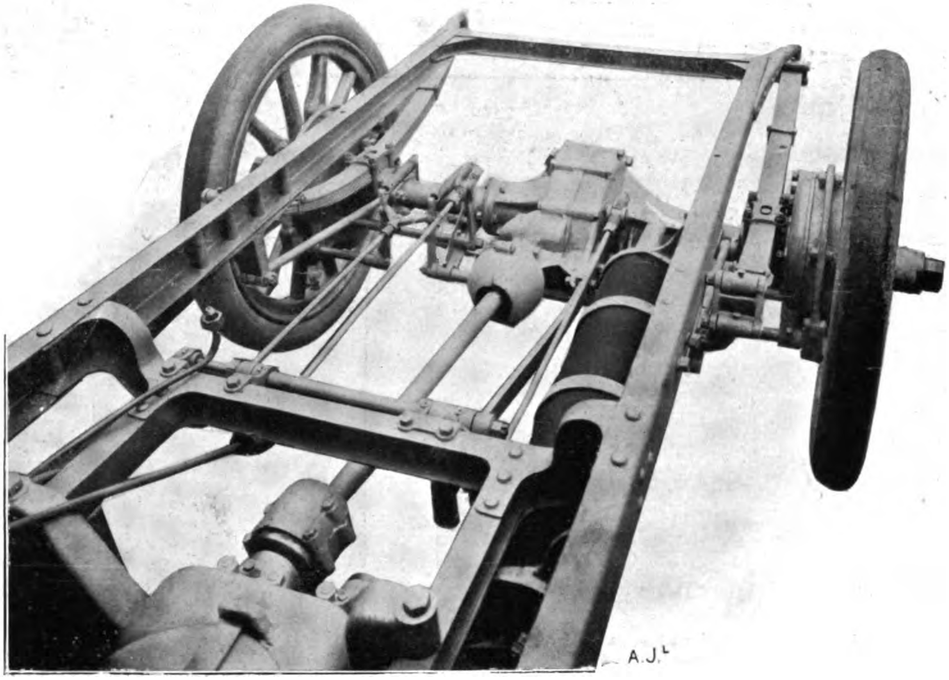


Fig. 1.—Rear portion of the 18-h.p. "National" Chassis, showing the arrangement of the hand and foot-brake mechanism on the "live" rear-axle.

One of the chief modifications has been the transference of the foot-operated brake from the transmission-gear direct to the hubs of the road wheels, so that this brake can no longer impose severe strains upon the shafts and gear-wheels which transmit the power, from the gear-box, to and through the live-axle. There are thus two sets of brakes acting direct on the hubs of the rear wheels, one pair being of the internal expanding type, and the other pair operating upon the outer face of the same brake-drums. The arrangement of these brakes is clearly shown in Figs. 1 and 2, the former giving an excellent idea of the operating rods with their compensating devices, while the latter enables the brakes them-

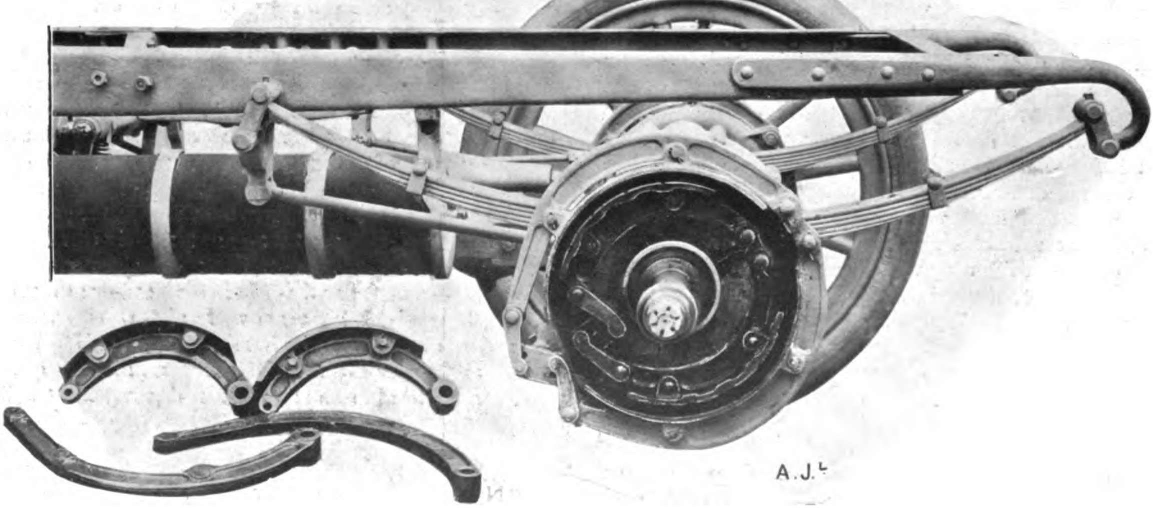


Fig. 2.—Side view of the 18-h.p. "National" Chassis, showing the rear portion, with the near-side wheel removed. The foot-operated, internal expanding brake is seen inside the hand-operated brake that acts upon the periphery of the same brake-drum. Also included in this illustration are a pair of internal, and a pair of external, brake-band-levers, the former having their renewable brake-shoes fitted to them.

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* [An illustrated description of the engine appeared on p. 179 of our issue of February 11th, 1905, and a general article dealing with the construction of the chassis was given on July 23rd, 1904, pp. 871 and 872.—ED.]

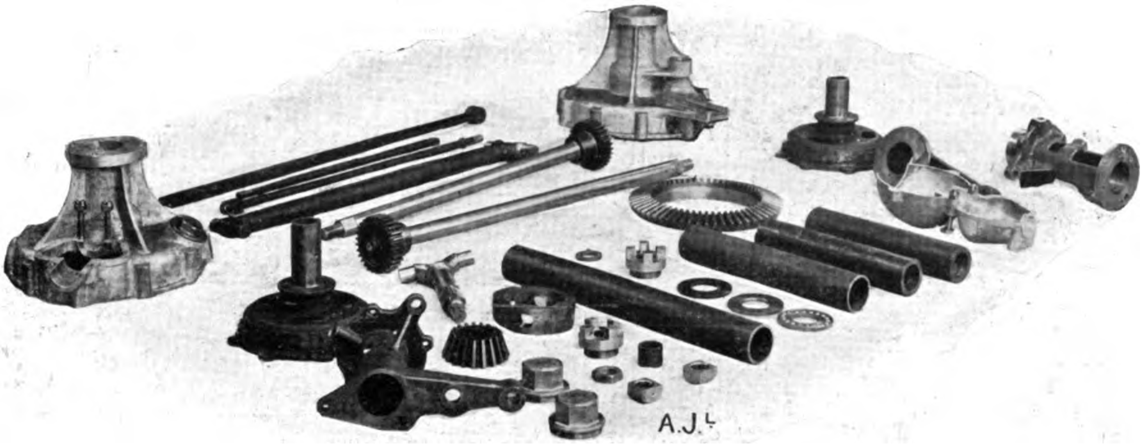


Fig. 3.—The chief component parts of the "National" "live" rear-axle, with its universally-jointed propeller-shaft, and the bevel-wheels that drive it.

selves to be seen. In Fig. 2 the road wheel, together with its brake-drum, has been removed, leaving the entire brake mechanism intact upon the chassis, while in the same illustration are included separate views of a pair of internal brake-strap levers, fitted with their renewable shoes, and a pair of external brake-strap levers with their shoes removed. Both brakes are of similar design, one end of each brake-strap lever being pivoted, and the other ends being connected by short links with crank-pins on the operating rock-shaft.

The same illustrations show the manner in which the short radius-rods are fitted between the side members of the frame and the spring-brackets on the axle-casing. In Fig. 1, the torque-rod that passes forward from the axle is also visible, but a word of explanation is required because in that view, it unfortunately appears to be hinged at its front end to the rock-shaft which controls the foot-brakes. As a matter of fact, it passes beneath that rock-shaft and is attached, with cushion springs above and beneath, to a hinged bracket beneath the cross-member of main-frame. At its rear end it is fixed rigidly to the casing that encloses the differential-gear and the bevel-wheels driving the axle. Other characteristics of this well-designed, and substantial, chassis will be noticed in Figs. 1 and 2, including the pressed-steel frame with its under-frame for the engine and the gear-box, the propeller-shaft with its neatly enclosed universal-joints at each end, and the long semi-elliptic side springs, lying between the frame and the road wheels.

Very great care has been taken in the design and construction of the live-axle—that most important part of any car of this type. It is built up in much the usual way, with steel tubes to enclose the revolving shafts, with a two-part casing about the central gear mechanisms, and with external stays beneath to take the bending strains. The road wheels run upon the outside surface of the stationary portion, thus relieving the shafts of the weight of the car, and the short shaft which connects the bevel-pinion with the propeller-shaft is supported by an additional bearing behind the bevel-pinion itself. Most of the component parts of the axle are shown separately in Fig. 3, and amongst them will be noticed the propeller-shaft, as well as one of the neat rings that form the simple universal-joints; in this type of universal-joint, the pins project outwardly from the two shafts, and the surrounding ring is made in two parts so that it can be made to receive, and form bearings for, the pins. Other parts which are prominent in Fig. 3 are the jaw-couplings by which the road wheels are connected to the "live" shafts.

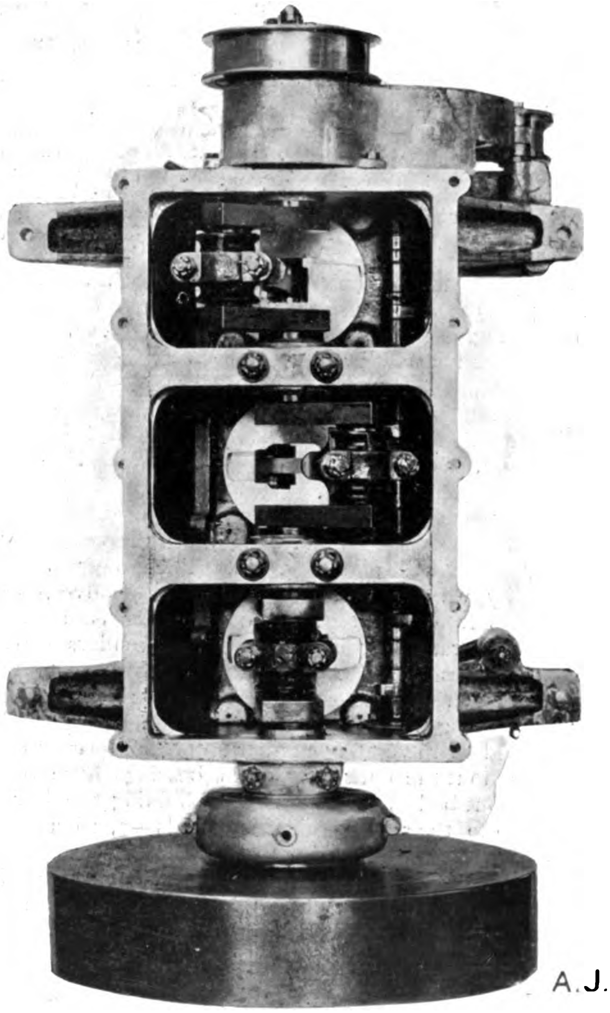


Fig. 4.—View, from beneath, of the 3-cylinder, 18-h.p. "National" engine, with the base of the crank-chamber removed. The crank-chamber is made in three parts, the base casting being quite independent of any moving parts, so that it can at any time be taken off for making a thorough inspection of the interior.

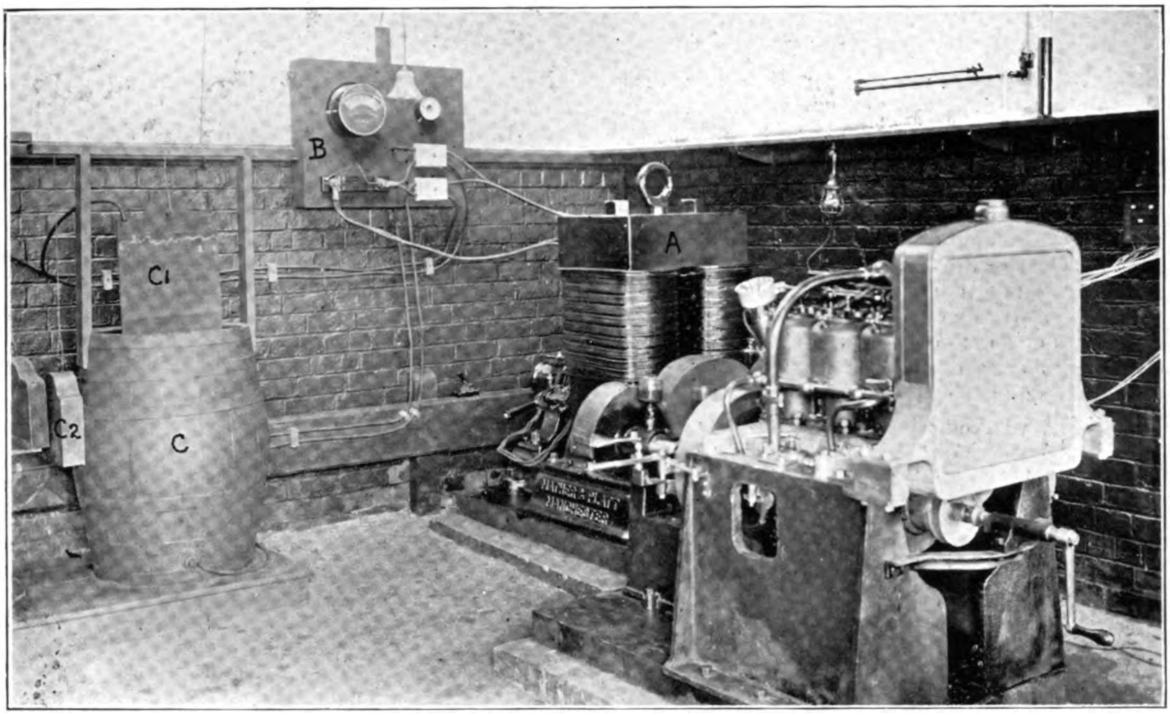


Fig. 5.—A corner of the test shop in Messrs. Rose Bros.' works at Gainsborough, showing a "National" petrol engine fitted up—with its own radiator, carburettor, and ignition coil—ready for testing. The power of the engine is measured electrically, the dynamo, A, being coupled up to it. From the dynamo the current is regulated by a simple water-resistance, consisting of the tub, C, the movable contact-plate, C^1, and the counter-weight, C^2, for balancing the plate, C^1; the metal plate can be immersed to any required depth inside the tub, thus varying the resistance in the electric circuit. From the readings of the ammeter and voltmeter on the instrument-board, B, the B.H.P. can at all times be calculated.

Fig. 4 is a view of the engine from beneath, the base-casting of the crank-chamber having been taken off. On the engine, the crank-chamber is made in three pieces instead of only two, and, therefore, the lowest portion is quite independent of all moving parts. The crank-shaft, with its four long bearings, and with the connecting-rods in place, is very well illustrated in this photograph, as also is the cam-shaft, up inside the chamber.

As now made, the engine gives 18-h.p. at a normal speed of 900 revs. per min., the cylinders having a bore of 4¼ in. and a stroke of 5¼ in. The power is controlled by varying the lift of the inlet-valves, the ignition is from batteries, the commutator is mounted upon a separate gear-driven shaft that renders it particularly accessible, the lubricator is subjected to the pressure of the exhaust-gases, and the circulating-pump for the cooling water forms a part of the engine itself, being fixed to the crank-chamber and being gear-driven.

Throughout the entire car, plain bearings have been adopted, but ball thrusts are used for holding the bevel-wheels up to their work. Three speeds—7, 16 and 30 miles per hour—are provided for by the gear-box, and a direct drive is obtained when the top speed is in operation. Usually the chassis is built with a wheel-base of 9 ft. 3 in., a track of 4 ft. 6 in., and is fitted with 870 mm. tyres, but it is also made with a 10 ft. wheel-base and with 875 mm. tyres for taking other types of body. In the former case the front and rear tyres are 90 and 100 mm. wide, respectively, and in the latter case they are 100 mm. and 105 mm. wide.

Engine Testing.

Very great care is taken to test the "National" engines in the works, under exactly the same conditions that they will subsequently have to run on the cars. For this purpose, the special arrangements shown in Fig. 5 have been made, this illustration being reproduced from a photograph taken in the test-shop. The engine is bolted down on the bed-plate, and is fitted with the actual radiator, carburettor, and ignition apparatus that are to be transferred with it to the chassis. It is coupled up, as seen, to the dynamo, A, and the current is led through the instrument-board, B, to the variable water-resistance, C. The load on the engine, as well as its speed, can be varied to a nicety in this way, by merely immersing the metal plate, C^1, to a greater or a less extent in the liquid contained in the barrel, C, for the amount of current that is allowed to flow through the electric circuit can thus be regulated to a nicety. At the same time, the power of the engine is indicated electrically by the instruments on the board, B. Every facility is consequently available for "tuning up" the engine properly before it is fixed to the chassis.

* * * *

Royal Commission on Motor Cars.

On Tuesday last, the Royal Commission on motor cars held their thirtieth sitting. All the members were present. The following witnesses were examined:—Mr. G. G. Parkins, of Upper Holloway; Lieut.-Col. Fellowes, of Great Cumberland Place; Mr. H. Lucas and Mr. Johnson, of Messrs. Joseph Lucas and Co., Birmingham; and Mr. W. Hoare Ward, of the Weldhen and Bleriot Co., Ltd.

A MOTOR CAR ELEVATOR.

There must be many motorists whose private garages do not permit of a motor car pit, and as the necessity for occasionally getting under the car remains, it may be justly said that some form of portable elevator, such as that introduced by Adams and Co., of which we give illustrations, is well calculated to supply one of the motorist's much felt wants. Little explanation of the device is needed in view of the photographs, which clearly show its application. Simple channel girders form the two side members of the framework, which serve to guide the wheels of the car as it is being hauled up the incline (Fig. 1). Two winding drums, A, with adjustable handles, A^1, are fitted in order to enable the car to be drawn up into position by means of steel cables attached to the back axle. When the car is in place the whole frame of the elevator may be tilted up into a horizontal position, and supported by a trestle or box so that all parts of the chassis are as much accessible from beneath as they would be from a shallow pit.

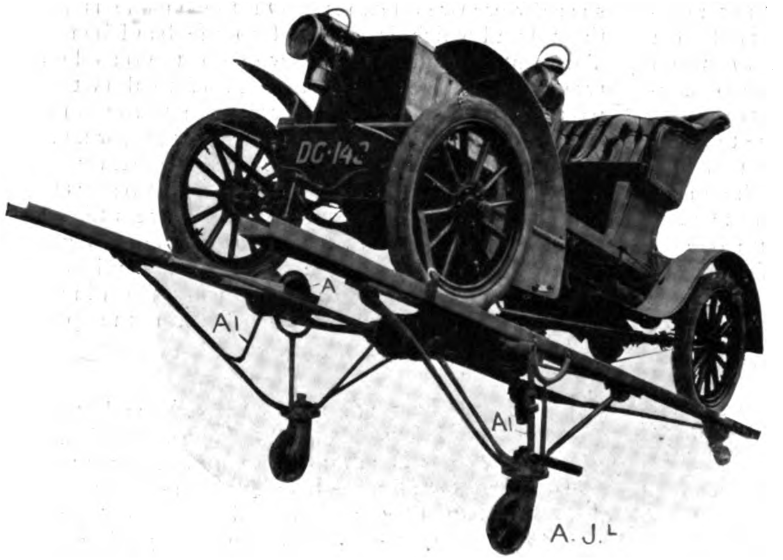


Fig. 1.—The Adams Elevator. View showing car on the Elevator when in an inclined position.

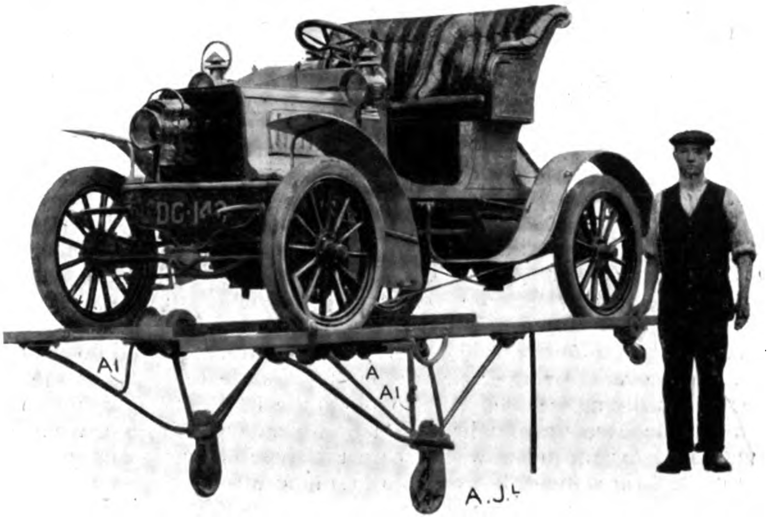


Fig. 2.—The Adams Elevator. View of a car in place after the Elevator has been tilted to a horizontal position. A trestle or box must be placed under the rear end of the framework to ensure security in this position.

It is not necessary, of course, to tilt up the framework in this way unless desired, because stout straps are provided for lashing the car in its inclined position. While so placed the machinery under the front portion is even more accessible, seeing that it is higher from the ground, and it is also in a somewhat more convenient position for working since there is not very much head room beneath the car when the elevator is horizontal.

As the width between the wheels of cars varies considerably, the elevator is made adjustable in this respect by means of a transverse screw and telescopic tie-rods. Being mounted on wheels, it is possible to move the car, when on the elevator, bodily from place to place, or to use the elevator as a turntable. When closed, the gauge is 3 ft. 5 in., when opened it is 5 ft. 2 in. The head-room provided for is 2 ft. 9 in., and the length of the channel 12 ft. Thirty feet of wire rope is provided on the drums, and the incline up which the car must be drawn is 1 in 3.

* * *

Effect of Motor Omnibuses.

There has been so much competition amongst motor omnibuses, particularly on the Cricklewood route, which seems to have been specially favoured by them, that various reductions have been made in the fares. One of the companies recently has reduced what was previously a 3*d.* fare for a $6\frac{1}{2}$ mile distance to 2*d.*, and the same Company has further lengthened the penny fare from Cricklewood by about half a mile. An interesting result of the improved communications to Cricklewood which the motor 'bus services have provided, is shown by the rapid filling up of much new house property in that suburb.

Progress in Australia.

In a communication received by the British Empire Motor Trades' Alliance, Limited, from the *Sydney Sunday Times*, it is interesting to learn that there are already some 500 motor cars running in Sydney and suburbs, and nearly 1,000 altogether in New South Wales. The New South Wales Government and sundry private companies are also establishing motor 'bus services. There are also about 400 motor boats on Sydney Harbour and the adjacent waters, and the New South Wales Motor Boat Club possesses about 140 active members. Evidently the automobile industry has been undergoing much the same rapid development in Australia as in this part of the world.

THE PULLMAN NON-SKID BAND.

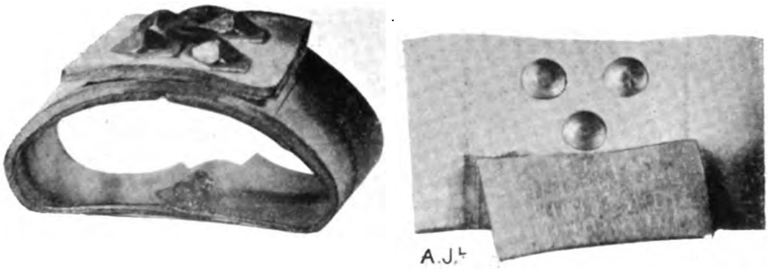
Few firms have such a well-established reputation in the manufacture of hard-wearing leather goods, even in England, which is notable for this work, than Messrs. Pullman, and that they should have turned their attention to the manufacture of a non-skid band is itself a matter for congratulation among motorists, to whom these things are of considerable importance.

In appearance the non-skids made by this firm are similar to the many other makes on the market, but there are one or two smaller differences in detail of construction, which are worthy of notice, and are well illustrated in our photographs. On the light-weight bands the rivets are inserted from the inside, and the hardened-steel nuts are riveted on the projecting ends. This allows the rivet heads, which are on the inside, to be smooth and flat, so that when covered by their protecting strips of leather they are hardly noticeable. It also allows the steel nuts to be made exceptionally hard and durable. On the bands used for the heavy-weight cars, this type of rivet is not used throughout, but only down the centre row. The other rows are formed by rivets which have pyramid-shaped heads on the outside, and their shanks are bifurcated, and riveted over on the inside.

Each band is formed by three separate strips of specially-prepared leather. On the outside is a fairly thick tread which is attached to the band beneath it. This central band covers the whole of the outside of the tyre, and its edges are chamfered off to allow them to pass over the beading of the tyre, so that, when in place, they are well under the rim of the wheel, which thus prevents the ingress of water between the leather and the outer cover. This is an important point because, even with very perfect vulcanising, there is always the chance that a tiny portion of the edge may come unstuck, and, if this is exposed, it is liable to collect dirt and moisture, which works its way in, thus destroying the adhesion of the remainder of the band. Beneath the principal leather band is another strip of leather which protects the inner ends of the rivets from the tyre.

Apart altogether from the excellence of any band in itself, there is also the manner of its fixing to be taken into account; but even when both are perfect, there is still the driver of the car to be answered for, and no doubt many motorists would save themselves much inconvenience, and no little money as well, if they could ensure that their chauffeurs would always practise true automobile economy, by considering their methods of driving with relationship to the effects they obviously must have on the tyres.

The Pullman Non-Skid.—Photograph of a band after completing 4,000 miles.



Two views of the Pullman Non-skids, showing (on the left) the Steel-Studded Tread used on the heavy-weight bands. The view on the right shows the smooth-faced inner ends of the special studs which are employed on the light-weight bands.

* * *

Railway "Enterprise" and Its Result.

A curious situation prevails at Brondesbury, a suburb in the north-west of London, which has for many years been very adequately served by the trains of the Metropolitan Railway. Some time ago, as is now very generally known, competing lines of motor 'buses were started, and these have since grown to such efficiency that many residents have transferred their patronage to them. Lately the Metropolitan Railway have so reduced their service from the station just at the most important time of the morning for business men, that many of the remaining would-be passengers have also been perforce compelled to make their journey by road. If this move on the part of the Company is merely an oversight, we fear that the management may find itself in a similar predicament to the cabmen after their strike, who discovered, too late, that the greatest effect of their action had been to make the majority of their erstwhile patrons, who had been driven to the homely but useful 'bus, confirmed users of that ubiquitous class of vehicle. No doubt the motor 'bus owners are fervently uttering hopes that the dearth of trains may continue.

Cheap American Cars.

A report from the United States announces that the Ford car makers are this year marketing a 12-16-h.p. 4-cylinder car at £100! Ten thousand is to be the year's output, and for 1907 this number is to be doubled.

AUXILIARY PETROL TANKS.

Devices for Preventing a Car from running short of Fuel on the Road.

MANY motorists have at one time or another experienced the annoyance of being stranded on their cars in the open country with their petrol tank empty and with many miles between them and the nearest source of supply, while even more cautious drivers must now and again have wished that there were some device on their cars that would save them any anxiety on that score. Some owners of cars have even gone the length of having a second tank fitted to enable them to carry an emergency supply, but as often as not the desired effect is cancelled in practice by habitually leaving both cocks open, while even if the auxiliary supply has been scrupulously kept in reserve, the petrol is apt to become stale and almost useless by the time it is urgently required.

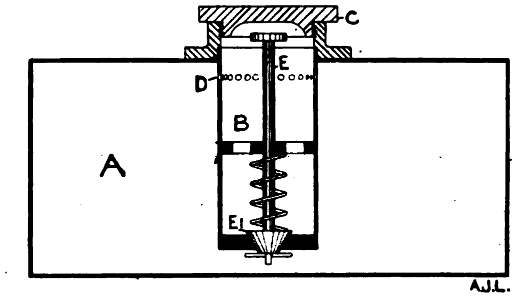


FIG. 1.

Our diagrammatic drawings show three alternative arrangements, all of which give equivalent results, the main features of Messrs. Soames and Langdon-Davies' invention being that the reserve supply is renewed with fresh petrol each time that the main tank is refilled, and that some definite act is necessary on the part of the driver before the auxiliary supply can be used. In all these illustrations the letter, A, is employed to denote the main tank; B denotes the auxiliary reservoir; C represents the filling cap; D indicates the overflow from the reservoir to the main tank; and the letter, E, is used for that portion of the mechanism which enables the auxiliary supply to be fed into the main tank. The device shown in Fig. 1 is equally applicable either for gravity feed or for pressure feed to the carburettor, while that represented in Fig. 2 is more especially intended for a pressure-feed system, and that in Fig. 3 is particularly applicable for gravity-feed.

Referring to Fig. 1, it will be seen that the reservoir, B, lies immediately beneath the filler-cap, C, inside the main tank, A, and that the row of holes, D, allows the petrol to flow over into the main tank as soon as the smaller reservoir has been quite filled. When, subsequently, all the fuel has been drawn off from the main tank, the auxiliary supply will remain in the reservoir, because, under ordinary circumstances, there is no other comunication between the two tanks than that through the holes, D. But it will also be noticed that a valve, E^1, is arranged in the bottom of the reservoir, B, and that this valve can be opened by means of the rod, E, which lies inside the cap, C. Thus, it is only necessary to remove the cap, C, and raise the valve, E^1, in order to transfer the reserve supply of petrol into the main tank. It is neither possible to remove the valve, E^1, bodily nor to leave it open, so that this device is practically proof against carelessness of any kind.

In Fig. 2, the filler, C, may be fitted some distance away from the tank, and the large connecting pipe, C^1, enters the top of the reservoir, B—which, in this case, is formed by a partition at one end of the tank, A. The only connection between the reservoir, B, and the main body of the tank, A, is through the pipe, D, which passes from the bottom of the former to the top of the latter. There is, however, a vent pipe, D^1, which is led from the top of the tank, A, to the filler cap, C, and this allows the air to escape when filling the tank. For filling, the entire cap, C, is removed; the petrol which is poured in then flows into the reservoir, and—as soon as the reservoir is full—the petrol overflows into the main tank. When, afterwards, the pressure in the tank has fed the main supply of fuel to the engine in the usual way, the reservoir, B, still remains full, and this auxiliary supply can only be utilised by first transferring it into the main tank. By the device adopted for this purpose, it is unnecessary to remove the filler cap, C, the only operation required being that of pumping air into the reservoir, B. This is done by removing the small cap, E^2, and attaching

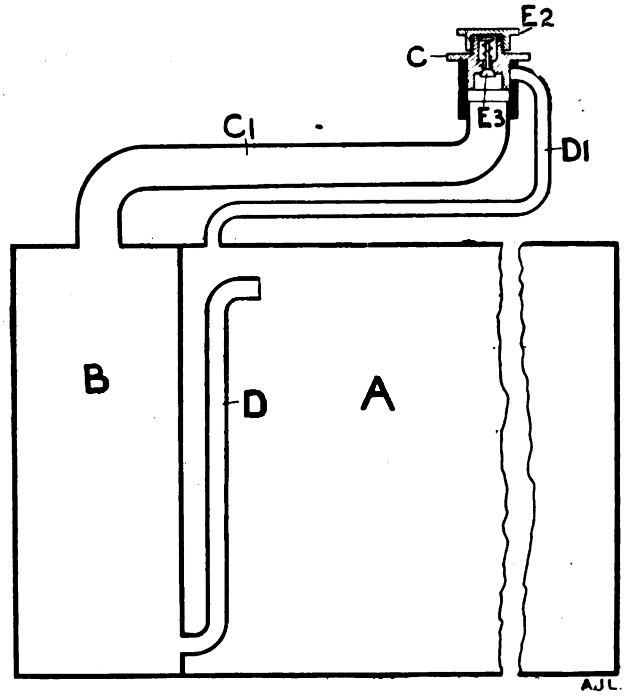


FIG. 2.

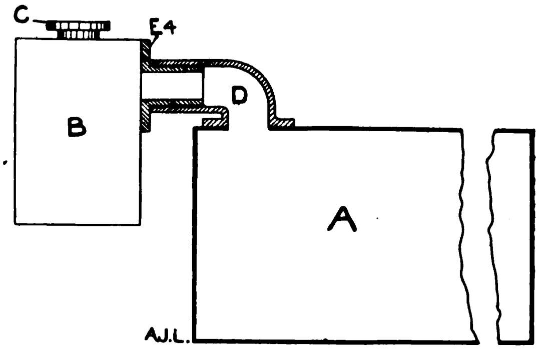


FIG. 3.

an ordinary tyre pump to the threaded nipple, when air can be forced through the valve, E^3, until the petrol is displaced from the reservoir, B, into the tank, A. As will be seen, the filler cap, C, closes the vent-pipe, D^1, and thus prevents the pumped air from entering direct into the main tank—an arrangement which is obviously essential.

In certain cases this device even enables the pressure to be retained in the tank while transferring the auxiliary supply of fuel from the reservoir to the tank, but on most petrol cars, of course, the pressure would be lost through the carburettor immediately after the main tank became empty. It will, too, be recognised in connection with this design that, if it is used for a gravity-feed system, the vent-pipe, D^1, would have to be replaced by an ordinary vent orifice communicating with the atmosphere.

Comparatively little need be said in order to explain the device shown in Fig. 3, for in this instance the reservoir, B, is quite distinct from the tank, A, and is merely connected to it in such a way that it can be turned upside down and its contents emptied into the tank through the swivel-joint (or gland if required), E^4, and the pipe, D. The reservoir must, however, be turned the right way up for filling the tank, since the filler-cap, C, is fitted in its upper face, and it is consequently impossible to fill the main tank without first filling the reservoir. It goes without saying that the connecting pipe, D, may be of any required length, but that it must enter the upper portion of the reservoir.

All these three variations of the same idea are remarkably simple, and are therefore likely to be adopted by many makers in the near future. At present, the designers are bringing their invention before the notice of automobile manufacturers, with the object of arranging with them to employ it on their vehicles.

THE RENAULT PATENT—INTERESTING DEVELOPMENTS.

There seems to be a probability, which has increased since we first referred to the subject, that we shall before long see a fight in the English Law Courts on the direct-drive question. As our readers will remember, the Renault Company of France are the proprietors of a British patent, which they consider will, if found valid, enable them to obtain royalties, damages, or an account of profits from all makers, sellers, or users of cars in this country who employ a gear-box which gives a direct-through-drive in combination with a live-rear-axle.

When referring to the matter before, we pointed out the essential need under such circumstances of combination amongst British manufacturers, who are in such case likely to become defendants. The need for such combination, however, is now superseded, since the Society of Motor Manufacturers and Traders announce that they will defend all proceedings taken against manufacturers, and that they have obtained counsel for the purpose. If the Renault Company or their supporters, therefore, are well provided with funds, there is a probability that we may before long witness an interesting and, technically, at any rate, highly instructive automobile patent case being tried in our Courts, which will have more interest for automobilists than any case that has been heard since the well-known Maybach carburettor action was fought some five years ago.

At any rate, if it comes off, there would be a fair fight and no favour. Whatever may be the outcome of the litigation, the Frenchmen can rely on absolutely fair treatment. The British Court of Chancery is perfectly unprejudiced and probably the fairest institution in the universe, and the judges, either in the Court of First Instance, in the Court of Appeal, or in the House of Lords, who are called upon to give their decisions, will decide the issue absolutely on its merits, on the evidence placed before them, and without even a suggestion of the bias which might in some countries possibly arise owing to the patent having originated abroad. That is one of the things of which Englishmen have a right to be proud. Our legal arrangements are far from ideal. They are much too expensive, and much too dilatory, but our judges of the Court of Chancery, the Court of Appeal, and the House of Lords, move in an atmosphere in which prejudice or partiality, at any rate, is unknown.

As regards the action of the Renault Company in France, it may be of interest in this connection to chronicle that some ten motor car manufacturers have, as the result of the action which has already been tried there, agreed to take licences from the Renault Company, and that the royalties the company fixed have been ½ per cent. per chassis for 1906 cars, and 1 per cent. per chassis for subsequent years. Of course, the provision has been introduced—as all good lawyers would insist on being done—to the effect that the licensee shall only be bound to pay the said royalty as long as the present decision of the Courts remains unreversed.

Thirsk Starts Motor 'Buses.

A new service of motor 'buses has been established in the Thirsk district, and the first vehicles were at work on the 8th instant. The Surveyor of the Rural District Council, who evidently does not like them, has reported that they are "making sad havoc" of the Ripon Road.

Continental Exhibitions.

In the absence of Prince Henry of Prussia, owing to the lamented death of the late King of Denmark, the Berlin Exhibition was opened on Saturday last by the Duke of Ratibor, in the Art Exhibition Building. About 340 exhibits are staged, but, as at Paris, there is nothing of any moment to record, bearing in mind the display of 1906 novelties at Olympia.

On the same day, the Turin Exhibition was inaugurated by the Duke of Genoa, officially representing His Majesty the King of Italy.

Motor Cars for Gold Mines.

The importance of the motor car for getting to a new goldfield which is off the line of railways, is being evidenced at present to the north-east of the Nevada Goldfield, where a new Eldorado, a camp called Manhattan, is said to have been discovered. Within a week the population of this mining camp has grown from 20 inhabitants to 4,000, and would-be gold-diggers and claimants are offering as much as £50 a day for the hire of motor cars to get them in time to jump their claims.

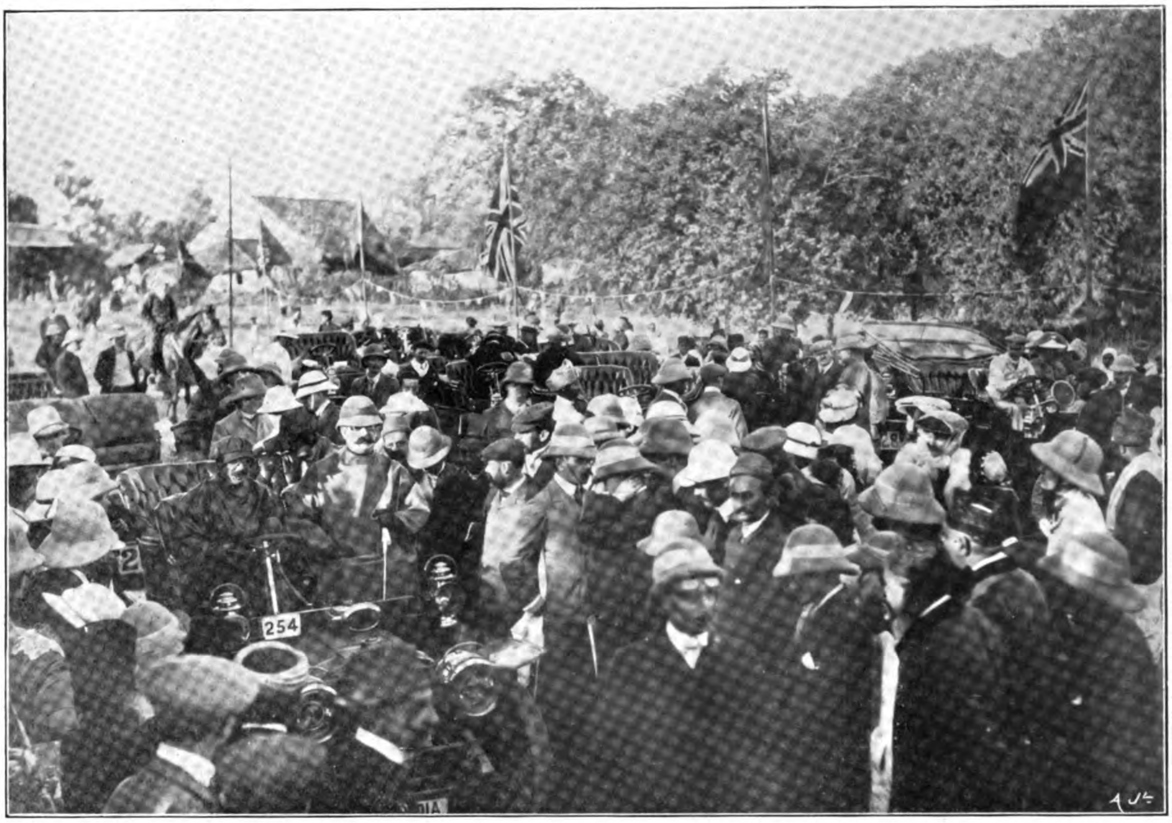
RACES, RECORDS, AND TRIALS.

INDIAN MOTOR TRIALS.

Somewhat more than twelve months have elapsed since the Motor Union of Western India inaugurated their very successful trials between Delhi and Bombay—an event in which, it will be remembered, no little interest was taken in this country. Now they have repeated the event, this year between Bombay and Mahableshwar, and with gratifying success. No less than thirty-seven cars left the starting-point on their first day's run to Poona, and throughout the whole 116 miles of the course traffic was suspended, except for military purposes, while the cars passed by. Interest among the natives there was in plenty, but of so curious a character that many of the motorists were not a little surprised at the effect of the appearance of their cars. So far from exhibiting any excitement, the inhabitants of the various villages, who had turned out *en masse* to witness the event, merely stood awe-struck and silent as the cars passed on their way.

On arrival at Poona all the cars were parked in the grounds of Mr. Jeejeebhoy's bungalow, half an hour being allowed for washing them down. There had been no incidents of note during the run, many of the cars arriving without losing any marks, although five did not turn up within the time limit. Mahableshwar was the second day's goal and the turning point of the whole run. It is only 75 miles distant from Poona, but the road, although good, is not easy, for it runs over the Katraj, Khandalla, Wai, and Panchgani Ghats, the latter especially being very long and difficult, winding its rising course around the hills for a distance of over 12 miles. In spite of these "obstacles," however, some of the cars again made non-stop runs, and few of the competitors had anything to complain of except punctures.

For the return journey a regulation was made respecting the passage through the tunnel at the summit of Katraj Ghat, this having proved a source of danger to motorists owing to its dim light, and the clouds of dust raised by the first few cars. For this reason, therefore, each competitor was prohibited from entering the tunnel before the preceding car had made its exit. At the very commencement of this day's run was the descent of the famous Satara Ghat, which, although really a very dangerous hill, was happily negotiated without accident. During the journey to Poona one of the three little 6-h.p. Wolseley cars—which are familiarly known among motorists in the country as the "Little Wonders"—unfortunately came to grief with a damaged gear. It is a striking testimony to the competing cars, however, when it is said that nothing more serious than this happened throughout the trials.



BOMBAY-MAHABLESHWAR TRIALS.—The scene at the Bombay starting point. The Richard-Brasier ready for the word to start.

By four o'clock on the following afternoon the cars were home again in Bombay once more, the actual control at Vincent Road being just a few miles outside the town. In the Class (D) for big cars, as we recently announced, no less than three cars tied, these being Mr. Sorel's De Dietrich, Mr. Khatau's Fiat, and the Paris-India Company's Richard-Brasier. They were, therefore declared joint winners, having each made non-stop runs. An agreement was entered into, by the competitors in question, by which the cup is to be inscribed

BOMBAY-MAHABLESHWAR TRIALS.—At Poona Control. Getting ready for the second day's run.

Bombay Trials—Finishing Cars and their Marks.

Owner.	Car.	Marks Lost.
CLASS D.—*Cars costing over £600.*		
Maharajah of Tikari	40-50-h.p. De Dietrich	2
W. L. Sorel	40-50-h.p. De Dietrich	0
E. J. Lee	35-h.p. Panhard	1
A. H. Hammond	24-h.p. Hotchkiss	1
Western India Co.	20-h.p. Thornycroft	8
M. Khatau	16-24-h.p. F.I.A.T.	0
Paris-India	16-20-h.p. Richard-Brasier	0
CLASS C.—*Cars costing over £450 and up to and including £600.*		
Dr. A. H. Deane	16-20-h.p. Argyll	0
Bombay Cycle Agency	16-20-h.p. Humber	150
N. M. Marshall	15-h.p. Orleans	96
G. C. Ebrahim	15-h.p. Orleans	5
M. Laillault	14-16-h.p. Chenard-Walcker	12
R. D. Tata	14-h.p. Bayard	91
K. and S. Motor Co.	12-14-h.p. Wolseley	36
CLASS B.—*Cars costing over £253 and up to and including £450.*		
Maharajah Rajpipla	16-h.p. Bayard	0
Globe Auto. Co.	14-h.p. Decauville	275
S. R. Lalkaka	12-14-h.p. Wolseley	0
Western India Co.	12-14-h.p. Vauxhall	1
B. R. Ireland	12-h.p. Darracq	1
Maj. C. N. L. Meyer	10-12-h.p. Bayard	0
Paris-India Co.	10-12-h.p. Richard-Brasier	19
F. B. Stewart	10-12-h.p. Argyll	0
F. B. Stewart	10-12-h.p. Richard-Brasier	10
H. Sorabjee	10-12-h.p. Relyante	64
E. J. Lee	10-h.p. Clement	42
M. Ebrahim	10-h.p. Bayard	0
CLASS A.—*Cars costing £250 and under.*		
R. D. N. Wadia	8-10-h.p. Humber	12
C. M. Banaji	6-h.p. Wolseley	9
C. D. Kerrawalla	6-h.p. Wolseley	0

with a statement to the above effect. In Class B there were even more ties for the "Charles Harding" Cup, for the three Clement-Bayards, together with Mr. Lalkaka's Wolseley, and Mr. Stewart's Argyll all made non-stop runs. A similar agreement, as in Class D, as to the inscription of the Cup was entered into by the competitors, and the committee have voted a small silver shield to each as a memento of their success.

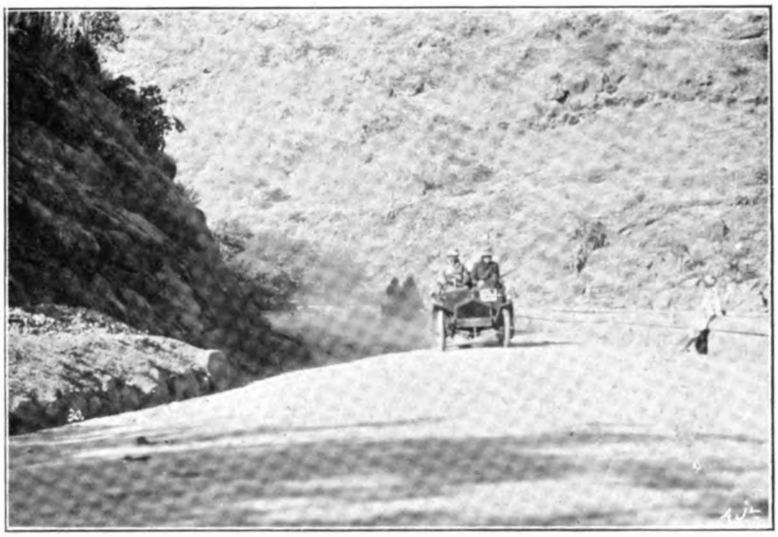
Dr. Deane's Argyll won the Challenge Shield in Class C, and Mr. Kerrawalla's 6-h.p. Wolseley the Union Cup in Class A. We annex a list of the competitors and the marks lost by them on the run.

A.C.G.B.I. Tyre Trials.

Relative value of the points to be taken into consideration in making the awards in the Tyre Trials:—

	Per cent.
1. (*a*) *Reliability.* — As shown by freedom from puncture (N.B.—From the 240 bad marks which will be imposed for each puncture or burst, 1 per cent. will be deducted for every minute occupied in repair or replacement less than 60 minutes) (*b*) *Durability.*—As shown by the running cost per ton-mile (N.B.—This cost will be made up as follows: Cost of outer covers and of inner tubes used or partly used, cost of repairs)	85
2. "*Yield and Return.*"—As shown by the "pile-driver"	10
3. *Other Points.*—Detachability, valves, security bolts, &c.	5
	100

Entries close on February 12th, at noon. Eleven firms have entered up to date.



BOMBAY-MAHABLESHWAR TRIALS.—The Humber Car, No. 33, on Wai Ghat, during the second day's run.

THE committee of judges appointed by the club for the trials of tyres, speedometers, and lamps is as follows:—

Ex-officio.—Hon. Arthur Stanley, M.P.; Mr. Alfred F. Bird, Sir Boverton Redwood, D.Sc., F.R.S.E.; Mr. Robert Todd, Col. H. C. L. Holden, R.A., F.R.S.

Mr. W. Worby Beaumont, Prof. C. Vernon Boys, Messrs. G. H. Baillie, Dugald Clerk, E. H. Cozens-Hardy, E. R. Calthrop, Major F. Lindsay Lloyd, R.E.; Messrs. A. G. New, Wilson Noble, Mervyn O'Gorman, Robert E. Phillips, Bernard Redwood, Earl Russell, Sir David Salomons, Bart.; Messrs. J. Lyons Sampson, A. A. Campbell Swinton.

Resilient Wheel Competition.

THE A.C. de France has accorded its patronage to this trial, which has been organised by our contemporary, *L'Auto*, and was announced in our issue of Jan. 13th. Under the modified rules there will be two classes, one for ordinary wheels shod with resilient tyres (pneumatics in contact with the road are excluded), and the other for spring-wheels in which the resilient medium is between the hub and the felloe. In each class there will be two categories.

The first is for vehicles having engines of not more than 314·16 cm^2 piston area, the total weight of the car with passengers and in running order to be not less than 1,500 kilogs. Luggage and spare parts for the wheel may not be included in this minimum weight. The second category is for vehicles which weigh (as above) at least 1,800 kilogs., and have engines of not more than 490·86 cm^2.

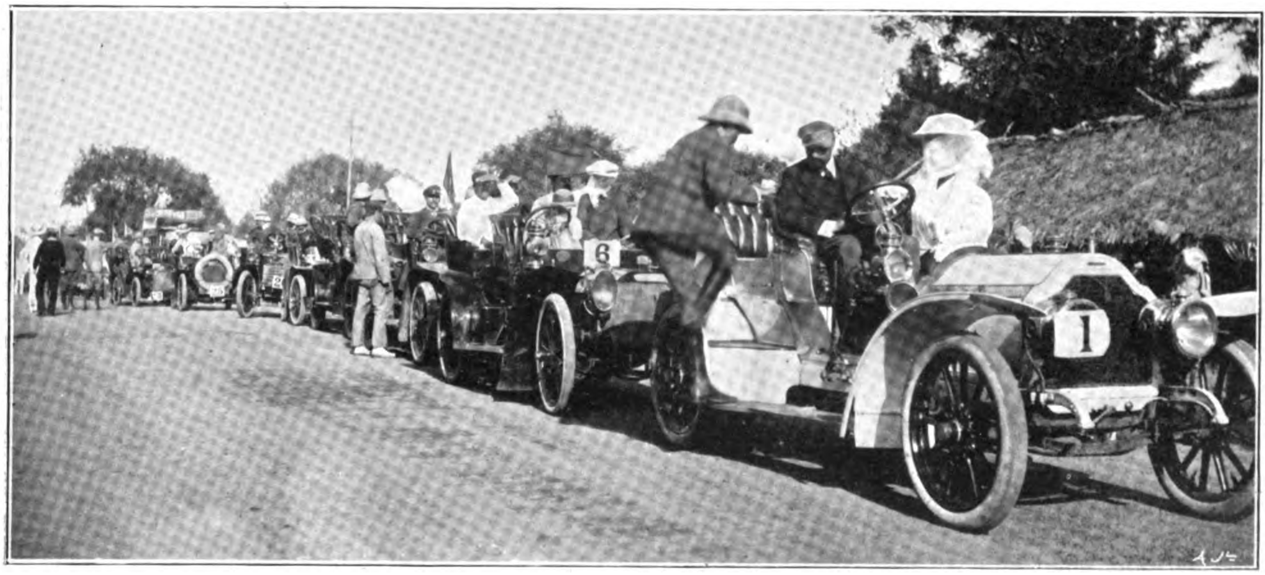
The entry fee for each vehicle is to be 100 francs, and the four wheels may only be fitted with devices of the same pattern. Entries will be received up to March 20th, 1906, and competitors must specify beforehand which parts of their device they wish to be allowed to change during the run, and how many times they will require the liberty. Drawings and models of the device must be submitted in advance.

Trials will be held over a distance of 2,000 kiloms. in daily stages of about 300 kiloms. Nine days will be allowed, which will give time for one day's rest, and for an exhibition if necessary. Closed "parcs" will be enforced throughout the trial; drivers may be changed, and each competitor must provide one observer for other competitors' cars. Repairs may be executed *en route* by those on the car with the tools carried by them, but an inclusive average speed of 30 kiloms. per hour must be maintained, otherwise the car will not be classed.

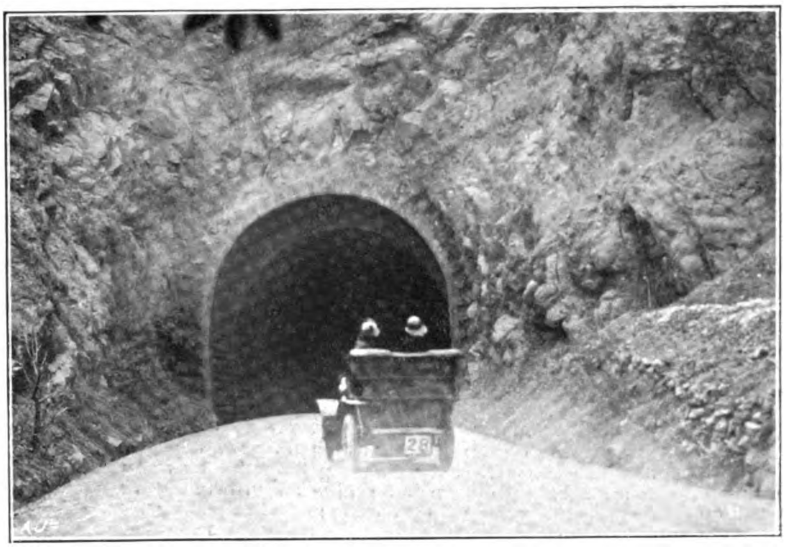
The competition will be held between March 25th and April 16th, 1906.

Swiss Industrial Vehicle Trial.

A TRIAL for commercial motor vehicles, entirely of Swiss manufacture, is to be held at Geneva, under the



BOMBAY-MAHABLESHWAR TRIALS.—Winners in the Contest.



BOMBAY-MAHABLESHWAR TRIALS.—The Clement Car, No. 29, entering the dangerous tunnel at the summit of Katraj Ghat, on the return journey during the third day.

auspices of the Swiss A.C. in April next. It is the first event of this character in Switzerland, and may possibly help to bring about a better feeling in the country towards automobilists. There will be two classes, viz.:—(A) Motor omnibuses, (B) Motor wagons and vans. Class A entrants will run over a distance of 435 kiloms., and Class B vehicles 341 kiloms., each spread over four days, with an exhibition of the competing machines at Berne on April 25th.

Milan to San Remo.

A COMPETITION for voiturettes between these two points is announced to take place from April 2nd to 8th next. There will be three classes, viz.:—

Cat. A.—Three or four-wheeled voiturettes, under 250 kilogs. weight, with one cylinder of 1,000 cc.

Cat. B. — Four-wheeled voiturettes costing, with carriage body, under 4.500 francs.

Cat. C.—Four-seated voiturettes costing, with carriage body, under 8,000 francs.

In every case not less than two riders must be in each vehicle. "Teams" of three cars of the same make will have a special cup for competition.

MOTOR CYCLING.

Land's End to John-o'-Groat's Trial.

AT the last meeting of the sub-committee of the Auto Cycle Club appointed to consider this matter, the following programme was drawn up for this Trial:—

First Day.—Leave Penzance, 7 a.m., for Taunton, via Land's End, Launceston (Lunch). Total 151 miles.

Second Day.—Leave Taunton, 8 a.m., for Warrington, via Worcester (Lunch). 201 miles.

Third Day.—Leave Warrington, 8 a.m., for Locherbie, via Kendal. 140 miles.

Fourth Day.—Leave Locherbie, 8 a.m., for Pitlochrie, via Stirling (Lunch). 155 miles.

Fifth Day.—Leave Pitlochrie, 8 a.m., for Tain, via Inverness (Lunch). 136 miles.

Sixth Day.—Leave Tain, 8 a.m., for John-o'-Groats, via Wick. Arrive John-o'-Groats, 3 30 p.m. 112 miles.

The time schedule has been worked out on a basis of minimum speed 15 m.p.h., and maximum speed 20 m.p.h.

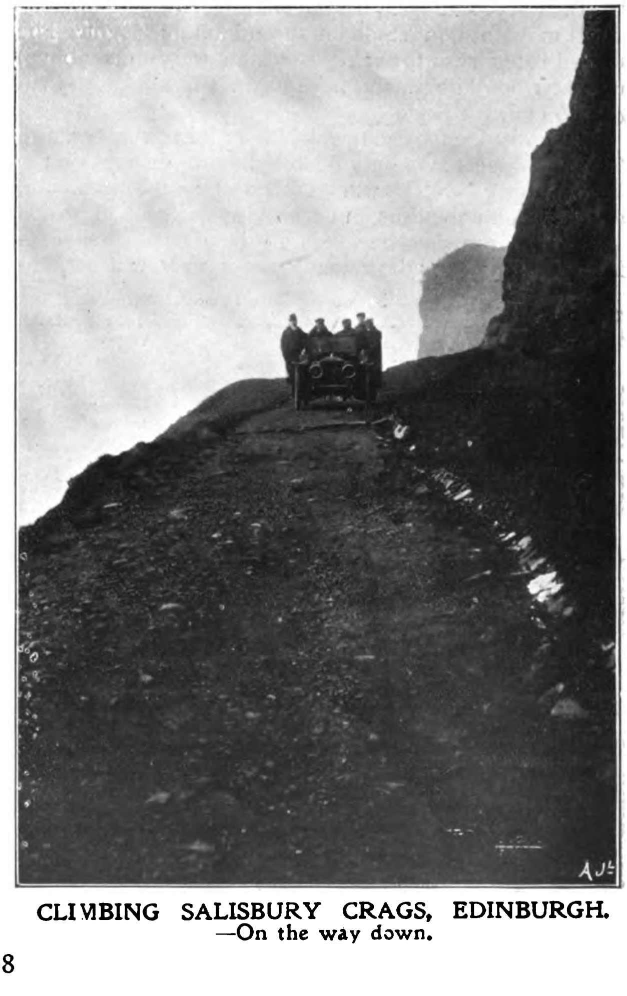
The Trial is to start on Monday, 11th June, and be open to all classes of motor cycles. This Trial is to take the place of the Annual Six Days' Trial, and no other long distance events will be held during 1906. Entrance fee, Five guineas first machine, Three guineas each additional machine to manufacturers; private owners, one guinea; members of Affiliated Clubs, 15*s.*; and of the A.C.C., 10*s.*

International Cup.

THREE challenges have been lodged with Austria, the holders of the Cup, for this year's contest, viz., by Great Britain, France and Germany. The date and place fixed for the event are June 29 in South Bohemia. For the British eliminating trials three machines are already assured, viz., two from Messrs. H. Collier and Sons, of Plumstead, and one from Mr. C. B. Franklin.

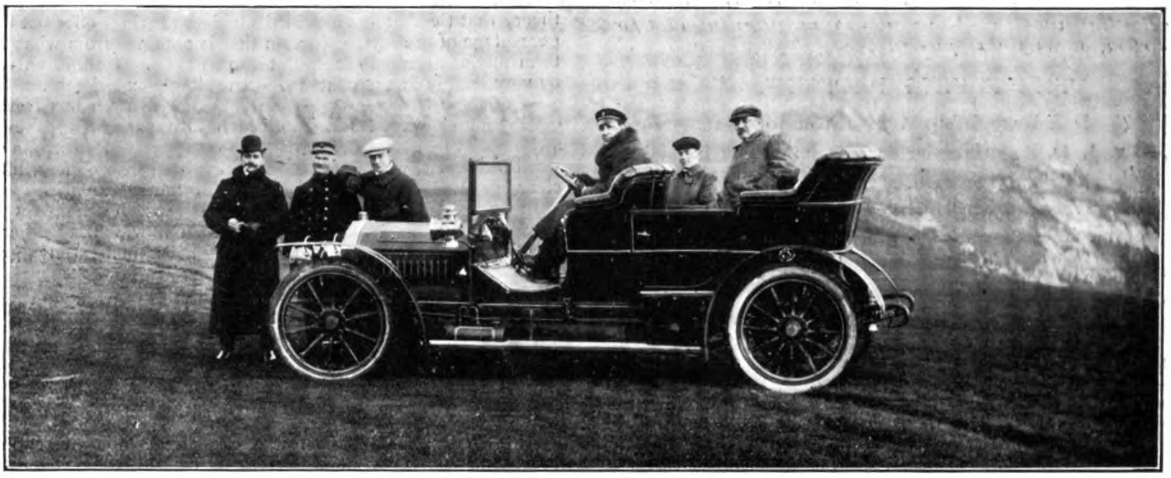
French Events.

IT has now been decided to run the Motor Cycle Club de France international championship events for motor bicycles only (30 and 50 kilogs.), to which we drew attention last week, in May next, the "Criterium du Motocycle," which embraces motor tricycles, tricars, and quads up to 250 kilogs. weight, being relegated to June.



CLIMBING SALISBURY CRAGS, EDINBURGH. —On the way down.

CLIMBING SALISBURY CRAGS, EDINBURGH.



CLIMBING SALISBURY CRAGS, EDINBURGH.—Mr. Charles Jarrott and his 22-h.p. Crossley Car at the point where he started for his climb up the Crags.

Very briefly last week we mentioned the climbing, by Mr. Charles Jarrott on his 22-h.p. Crossley car, of the famous "Radical Road" up the Salisbury Crags at Edinburgh. We have now received a series of photographs of the event, which we reproduce this week, and the following pithy account of the feat from *The Scotsman* gives some further points in regard to the performance, and shows the estimation in which Mr. Jarrott's climb is held in the Scottish capital. The task, Mr. Jarrott mentions, was a difficult one, particularly by reason of the fact that the ground was exceedingly soft and offered no holding for the tyres. The path itself was an ugly one and very slippery, and at spots on the ascent deep gullies led to the sheer cliff, where faulty steering would have meant a drop of from 800 to 1,000 feet.

The Scotsman writes:—"Motoring on the 'Radical Road.'—The path—for it is little more—which skirts the base of the Salisbury Crags and is known as the 'Radical Road,' is about the last road in the vicinity of Edinburgh where one would expect to encounter a motor car, but Mr. Charles Jarrott, the well known motorist, yesterday afternoon accomplished the feat of driving his car to the highest point of the road, turning and bringing it back again in perfect safety. The car was a 22-h.p. Crossley, and it carried six passengers.

"The gradient in places appproaches 1 to 4, and there are bits of the road where it required the most skilful steering to prevent the car from overbalancing. The climb was made from near where the flag post denotes the entrance to the 'Hunters' Bog,' as approached from the Albert Gate, and it was in itself no mean feat to get the car on to the track from the drive.

"This is believed to be the first time any vehicle has traversed the 'Radical Road.'"

Likewise the Cadillac.

A similar performance was also undertaken and successfully carried through by Mr. F. S. Bennett on an 8½–10-h.p. Cadillac car. Mr. Bennett travelled up the "Radical Road" and descended the rocky face of the Cragside to Holyrood Palace—a remarkable feat in view of the low horse-power of the Cadillac car.

Mr. Bennett's return journey did not follow the same route as that of Mr. Jarrott, it will be noticed, and if there be any difference between the two descents, the palm for difficulty lies with that leading to Holyrood Palace. It is said that no vehicle has ever before made the ascent, and if the tradition has any truth in it, then it is very fitting that the automobile should be the first to reach the top, for if the conquest of the hill had to wait for a still more perfect form of road locomotion to be evolved, it would probably remain "untracked" for a very long time to come.

CLIMBING SALISBURY CRAGS, EDINBURGH.—Commencement of the descent.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THE FLYING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Mr. J. D. Roots is under a wrong impression in thinking I have overlooked the difficulties of starting from and alighting on the ground with an aeroplane, for it is quite reasonable to suppose that an aeroplane cannot be supported in the air with a wind velocity of much less than 20 m.p.h. passing under its surface, and I gather this is Mr. Roots' chief objection. Although this appears to be a difficulty at first, I think eventually it will be overcome in a satisfactory manner. One thing, it is desirable that an aeroplane for general use should be mounted on four wheels for simplifying starting and alighting.

On a calm day, when there is little or no wind about, a bird will arrest its motion, as Mr. Roots states, by turning its tail downwards, but when there is a wind, it does not necessarily do this, for with its wings outstretched it will gradually reduce its speed until it is comparatively stationary a few inches above the ground, when it will suddenly close its wings and step on to the ground. So should there be a breeze of, say, 20 m.p.h., then it is possible to alight with practically no momentum, and also a start from the ground against this breeze could be made with only a very slight forward motion, as the Wright Brothers have done.

But one of the difficulties, if this can be called one, is when there is a calm, then the required speed must be obtained by moving the machine along by its own propeller; on alighting, it is a simple matter to turn up wind-resisting surfaces and so check the speed, or, on the other hand, say the machine alights at a slight angle and at a speed of 20 m.p.h., this momentum could be quickly arrested by applying the brakes to the wheels.

I hardly agree with Mr. Roots' statement that "an aeroplane will only be usable, whatever the success and skill eventually attained with it, in a treeless and houseless country." There are many spots in and around most towns where departures and arrivals could be made by motor-driven aeroplanes, should they be a success and become general; surely landing and departing places on open spots will be quickly made, namely, clear and smooth-surfaced spaces.

Certainly it is a very desirable feature to be able to rise straight up, but it appears to me that if this is done on a calm day it must entail a great expenditure of power.

With reference to the eagle and the albatross experiencing difficulty in rising from the ground, it all depends if there is a wind; the former can rise easily in either case, whereas I have only seen the albatross rising in the wind, which it does when on the sea by facing it, and on reaching the crest of a wave it outstretches its wings, the wave passes on leaving the albatross floating on the air. But should the albatross find itself in St. Paul's Churchyard, it would, I should say, simply flap its wings in the orthodox manner, whereas, on the other hand, if it had a sufficiently light and powerful motor, it could, by outstretching its wings, be propelled out either in a spiral form or in a straight line up one of the roads.

I quite agree with Mr. Roots that a commercial aerial machine must carry passengers with the same degree of safety as the train and the motor car. I hope the future will prove the aeroplane not only to be the quickest but safest means of locomotion.

Yours faithfully,
Putney. A. V. ROE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Mr. J. D. Roots, in this week's issue, has very happily brought the albatross into the discussion centreing on aeroplanes, and of a surety the albatross, if he could only speak, could tell us much concerning this subject.

It has been my fortune to spend many a happy hour watching these birds, leaning over the poop rail of a sailing ship travelling at a moderate speed; I have seen a huge bird appear right astern, come up on the quarter about a hundred yards off, take out his clutch, and then without one single flap of his 17-ft. spread of wing, circle round the ship, and finish up at the place where he started, let in his clutch again for half-a-dozen reciprocations, and continue the manœuvre *ad infinitum*.

According to the ordinary accepted laws, in order to keep a body afloat in the air—that is of a greater specific gravity than this fluid—work must be done either by this body falling or by the reduction of its initial velocity. But in the case of the albatross it certainly did not fall, as it was only a few feet from the water at the commencement, so the work must have been obtained through the inertia source, but although I repeatedly endeavoured to observe this, I could never notice any diminution of speed.

This, I have come to the conclusion, can be explained by the theory that the feathers of a bird's body and wings offer but a small percentage of the surface friction that is obtained from what I may term any artificial substance yet known to us. I think this could be very readily demonstrated by some simple experiment.

With regard to the suggestion that the albatross has trouble in getting under way, I have noticed he always accomplishes it by swimming to windward, and as he tops the crest of a wave, a downward beat of his wings, and a good kick from his web feet, lifts him clear, and he is soon going at the rate of knots.

In alighting, say to pick up some scraps, he makes a spiral descent, and finishes by an upward sweep, which, together with outstretched feet, bring him to rest in a moderately graceful manner.

Yours faithfully,
Ipswich, February 3rd. ARTHUR F. EVANS.

CAR INSPECTION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With reference to the interesting paragraph which appeared on page 105 of your issue of the 27th January to the effect that the manager of a motor company has arranged for a periodical examination to be made by an inspector of engineers of every car sold by him, it may interest you to know that we some time since decided on this policy, and that at the present time one of our 8-cylinder cars is touring the Kingdom with an inspector from our works on board, who is making a thorough examination, gratis, of every Rolls-Royce car—2-cylinder, 3-cylinder, 4-cylinder, 6-cylinder and 8-cylinder—which has been sold by us, and we are glad to report that this experiment has proved not only to be a great satisfaction to the owners of cars, but also a great instruction to us, as by this means we have been able to effect small adjustments which were naturally overlooked by an unskilled mechanic, or amateur owner of a car, and have—as acknowledged by the latter—made considerable improvements in the running of our cars.

These tours of inspection are arranged to take place periodically.

Yours faithfully,
C. S. ROLLS AND CO.,
Geo. H. Malton, Managing Secretary.
February 1st.

TRIALS OF RESILIENT WHEELS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As one closely connected with motor traction, I have read the accounts of the recent 4,000 miles Reliability Trials established by the Automobile Club of Great Britain and Ireland with keen attention.

That power-driven vehicles are destined, sooner or later, to supersede animal traction upon our roads is admitted on all sides. How soon or how late this consummation will arrive depends solely upon the evolution of the practical, economical, vibration-absorbing wheel.

The Automobile Club has once more earned the gratitude of all who are interested, directly or indirectly, in the new but already vast movement of which it is the acknowledged head, by initiating these competitions, but it appears to be a matter of regret that when inaugurating these exceedingly valuable tests, the club committee did not go a step further and set forth more clearly the only conditions under which, in their opinion, it is possible to definitely determine the actual vibration-absorbing qualities of any particular wheel offered for trial.

It certainly appears to be very hard upon the inventor or proprietor of any spring wheel, that after pluckily incurring all the labour, anxiety, and heavy expenses which these official trials involve, he should be told by the judges, at the conclusion of the 4,000 miles run, that his performance has practically demonstrated nothing. Yet this is apparently what has actually happened in the case of the reliability trials of the two spring wheels which have alone, up to now, had the courage to offer themselves for public trial, owing to the fact that both these spring wheels were furnished with solid rubber tyres on their outer periphery.

I observe in the certificate of performance in a 4,000 miles long-distance trial of the Middleton pneumatic hub wheels, published in *The Automobile Club Journal*, Vol. XI., No. 194, page 40, the judges emphasise the fact that this wheel "may be run with a deflated tube . . . . and that the fact that it is deflated is not readily detected by those riding in the car." They continue: "This points to the importance of the part played by the solid rubber tyre in connection with this device," and they suggest that "the true way to test the efficacy of the pneumatic hub would be to try it in conjunction with iron tyres."

The same remarks might obviously have been made with equal justice and equal reason in regard to the other set of spring wheels, the Hallé, which underwent a similar trial.

Such a test as that proposed by the judges would indeed be severe, almost to the point of brutality, but would at least have the advantage of leaving no room for doubt in the public mind as to how much of the vibration-absorbing qualities claimed by any particular wheel is due to the old device of a solid rubber tyre and how much is due to the new device introduced by the inventor.

The first man who designs and builds a set of spring wheels with steel rims or treads capable of carrying a car of say 2 tons over ordinary English country roads, *averaging* 20 miles an hour (which would necessitate occasionally attaining a speed of 30 miles an hour) will have gone far towards solving perhaps the most pressing mechanical problem of the day.

Yours truly,
CECIL EDGE.

February 5th.

FOUR CYLINDERS AND SIX CYLINDERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The suggestion which Mr. Johnson makes on behalf of Messrs. Rolls and Company is a good one; but I think the jury of "unconverted" persons which he proposes is open to the objection that so much could be done to hoodwink them by an expert driver. I would sooner see the jury composed of men who are alive to all the "tricks of the trade."

I do not think that further correspondence will do anything to settle the relative merits of the two types of engine. The proof of the pudding is in the eating, and the "eating" is best done on the road.

The bore and stroke of the Sunbeam car which I propose to use are 95mm. and 120mm. respectively, and the normal engine speed is 1,000 revolutions per minute. My wheel base is 9 ft. 7 in.

I shall be pleased to meet any 6-cylinder car of similar power in a contest such as has been proposed. We shall begin to learn something then.

Yours faithfully,
T. EASTMEAD.

February 1st.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We note under the heading of "4-cylinder versus 6-cylinder" a letter from Mr. G. Smith.

In his letter Mr. Smith says that Mr. Edge must be perfectly well aware that there is no such thing as an up-to-date 40-h.p. Mercedes, as they do not make this model for 1906.

We should like to point out, in order to prevent any misunderstanding, that the 45-h.p. 1906 Mercedes, fitted with direct drive, ball bearings to engine, &c., takes the place of the 40-h.p. 1905 model, and the 35-40-h.p. 1906 model takes the place of the 28-32 1905 model.

Yours faithfully,
For Ducros Mercedes Limited.
H. DU CROS, Managing Director.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am sorry to see that Captain Deasy, after making a challenge on behalf of the 4-cylinder car, which I accepted with a 6-cylinder, has now withdrawn, because my 6-cylinder Napier is too fast.

When I accepted the challenge I appreciated that on the speed question I should beat him, and that is why I suggested further tests of silence, hill-climbing capabilities, &c., but as even on these points he does not think that the 4-cylinder would be superior, I am willing to leave the matter in the position he has left it, namely, making a challenge, and then refusing acceptance in accordance with the conditions that he himself laid down.

Yours truly,
S. F. EDGE.

February 1st.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I note that Captain Deasy expresses in the Press the hope that a match may be arranged between a 6-cylinder car and his own 4-cylinder car. I am pleased to inform you that, on the 31st ult., when I informed Captain Deasy that I could arrange for one of C. S. Rolls and Company's 6-cylinder cars to be run against his 4-cylinder car, provided that the result should not rest purely on speed, but that the advantages which are claimed for the 6-cylinder car over the 4-cylinder car should also be taken into consideration, he generally agreed to the proposal. I think I may safely say, therefore, that we may look forward to a very interesting trial between a car driven by four cylinders and a car driven by six cylinders.

As the trial is likely to be of interest to your readers, I trust that you will permit us to communicate to you for publication suggestions concerning the form of contest, as it is possible that your readers may help Captain Deasy and myself to arrive at the best form of competition.

I wish, at the outset, to state that in the design of the 6-cylinder Rolls-Royce motor car, the desirability of obtaining the highest possible car speed out of a given piston area was not viewed as the primary consideration. This question was, of course, specially studied in the construction of the Rolls-Royce Tourist Trophy cars. In producing the 6-cylinder cars however, a difference in speed of a few miles per hour has been considered as being of little importance as compared with absence of engine vibration, smoothness of retardation and acceleration without declutching, removal of the necessity of changing gears, absence of shock, and silence.

The suggestion which I have placed before Captain Deasy, for his kind consideration, are, that the contest take the form of a reliability trial run on the high roads at the legal speed, with the additions of speed tests on hills and on the flat to be held on private roads; the jury, consisting partly of automobile experts and partly of private owners, to be divided into two halves, which would change cars at mid-distance, and would ride on each car during the speed tests; the jury to give records of the superiority of one car over the other as regards speed on the hills and speed on the flat, and to give opinions as to the superiority of one car over the other in respect of each of the points above-mentioned. As from a rough calculation it appears that Captain Deasy's 4-cylinder car has a piston area of 487 sq. cms., while the 6-cylinder Rolls-Royce has a piston area of 468 sq. cms., the match should be extremely interesting, especially if Captain Deasy will accept the suggestion that the total weight of the cars, together with passengers, should, by means of ballast, be made the same, and that the area presented to wind-resistance, should, so far as possible, be made identical in both cases.

I am, Sir,
Yours obediently,
CLAUDE JOHNSON.

February 2nd.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I notice a somewhat curious statement made recently in your paper by a correspondent who was trying to uphold the 4-cylinder principle against the six, and one of his arguments was that the 6-cylinder engine had 50 per cent. more parts than the 4-cylinder.

The statement appeared to me so far from the truth that I had the actual facts got out and the engine of a well known make completely taken to pieces, and all the parts carefully tabulated and counted, and I find that the parts in a 4-cylinder engine number 776, and that the increase on a similar powered 6-cylinder is less than one quarter.

Perhaps your correspondent would not mind now giving information as to why he made such a wild statement. I have all my papers carefully tabulated so that he can check them if he so desires. I think it will come as rather a surprise to many people that the 4-cylinder principle, which they have been upholding as of such great simplicity, should consist of 776 separate and distinct pieces, and it will now be clear to them why the 6-cylinder engine will wear so much better than the four, as, owing to the very even turning motion, the large number of pieces that are necessary in a multiple cylinder engine have the shock on each part so reduced by the Napier 6-cylinder principle.

Yours truly,
S. F. EDGE.

February 1st.

A PROPOSAL AND A CHALLENGE CUP.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—It has struck me, in connection with the forthcoming match between 4-cylinder and 6-cylinder cars, which is at present being arranged between Mr. Claude Johnson and myself, that although this match will no doubt be interesting in itself, the result may not be absolutely conclusive as to the respective merits of four or more cylinders. I have therefore decided to offer a cup, valued 100 guineas, to be called the "Deasy Challenge Cup," for a competition, to be run under rules the general principles of which are briefly outlined below.

I trust that the Automobile Club will see their way to take this matter up, as I believe the competition will not only be of great interest, but exceedingly useful to the automobile world.

If no better opportunity is available, I would suggest that the competition take place in the Isle of Man, at about the same time that the Tourist Trophy is held.

Yours truly,
H. H. P. DEASY.

February 6th.

Proposed Rules for the "Deasy Challenge Cup," value 100 Guineas.

1. The competition to be under the control of the A.C.G.B.I. Distance to be not less than 150 miles, nor more than 250 miles.

2. To be confined to *bona fide* touring cars of standard types, as usually sold to the public, and with a limitation of power, as in the "Circuit Européen."

3. Cars of three cylinders, or any number above, to be eligible, provided the total piston area of all the cylinders does not exceed the total maximum area of four cylinders, as defined by the rules of the "Circuit Européen."

4. Minimum weight and minimum standard dimensions to apply to chassis and bodies.

5. Minimum load to be five persons, and about 150 lbs. of luggage, or the equivalent.

6. The race to be open to the world.

7. The winning car shall be that which completes the course in the shortest time; but the record of petrol consumption, speed on the level and on hills, gear ratio, weight, and other features which are likely to be of interest to automobilists, to be published.

8. The cup to be the absolute property of the *entrant* who wins twice in succession or three times in all.

SIX-CYLINDER *v.* FOREIGN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have read with interest the various discussions in your late issues of the four *v.* the 6-cylinder and the British *v.* the foreign cars. Having had a 6-cylinder Napier put at my disposal by Mr. S. F. Edge, and also an inspection of the 6-cylinder under construction at the Napier works, I am certain one can only realise the various advantages of the 6-cylinder over the four by close inspection of the internal parts of the engine, and by the way Mr. Cecil Edge put the 6-cylinder car to various tests which I suggested. This is where the British manufacturer is showing his heels to the foreigner. I do not think it worth while for agents in this country representing foreign cars to try and make the public doubtful as to whether the foreign car is in any way superior to the British manufactured car. It may be the agents for the foreign cars are feeling the effects of the sale of the British cars and the way the public are preferring the British to the foreign car, or it may be because the foreigner is not manufacturing a 6-cylinder car, which I believe I am right in stating; but I do not hesitate in saying there will be only one more Olympia Show, or there may not be even one before the public will see the foreign agent at the shows, opening the bonnet of their foreign cars, and there you will see the 6-cylinder engine. I was much amused in one letter, the writer stating that it was a good thing for the British industry that foreign built cars have been imported freely into this country, as the English constructors have had set before them the finest products of Continental factories to test, copy and criticise. This, in my mind, is where the British manufacturers have been put to a great disadvantage, as they had only one market for their produce, and in this one market they had to compete against the whole world, wherefore the foreign manufacturer has had the advantage of two markets (one protected for themselves), and so being in a position to lay down a large factory with a big output, and thereby putting them in a much better position to experiment with the profits of their larger output, whereas the British manufacturer had a smaller output, and had to compete with the foreign cars in their own market. I think this can easily be proved by the way some of the British firms have been financially in very low water in years passed; now the principal experimenting is over, and the British manufacturer is put on a little fairer competition with the foreigner, and has now put on the market a 6-cylinder car, and if the foreigner follows in the Britishers' footsteps by placing 6-cylinder cars on the market, I think I am quite right in saying that British manufacturers can claim themselves to be the leading motor manufacturers of the world, and in answering this time only will tell.

Yours faithfully,
J. PERCY DEAN.

February 5th.

Developments in the Edison Cell.

THE Edison cell has been re-modelled once again. The solemn announcement is made that the existing types are liable to lose capacity. This is the official recognition of what has all along been an open secret, a secret so open, in fact, as to have had no little effect in keeping the Edison battery out of commercial employment. We refer, of course, to the peculiarity that out of a particular number of cells installed for any particular purpose, say in an electric car, a certain number, it may be five, ten, or fifteen, out of fifty, would lose capacity without apparent rhyme or reason. Boiling, it has been said, restores their capacity, but boiling accumulator cells is not a nice operation to undertake. It is now claimed for the Edison battery that a new method of construction has got over this difficulty. The positive plates of the old cells, it will be remembered, were constructed of bricquettes of nickel oxide enclosed in perforated sheaths of nickel-plated sheet steel. This type of structure has now been abandoned or at any rate replaced by a tubular arrangement, the positive plates consisting of a number of vertical perforated tubes connected together in a grid, the nickel oxide being arranged inside the tubes. It is claimed for this arrangement that the loss of capacity referred to is completely eliminated. The truth of this contention obviously depends on the correctness of the assumption that the loss of capacity was really due to the alleged cause, *i.e.*, diminished continuity between the active material and the supporting grid. It is by no means certain that this is the true explanation, and we shall consequently not be at all surprised to find that the Edison cell is still liable to unexpected loss of capacity. Let us hope, however, that this surmise will not be borne out in practice.

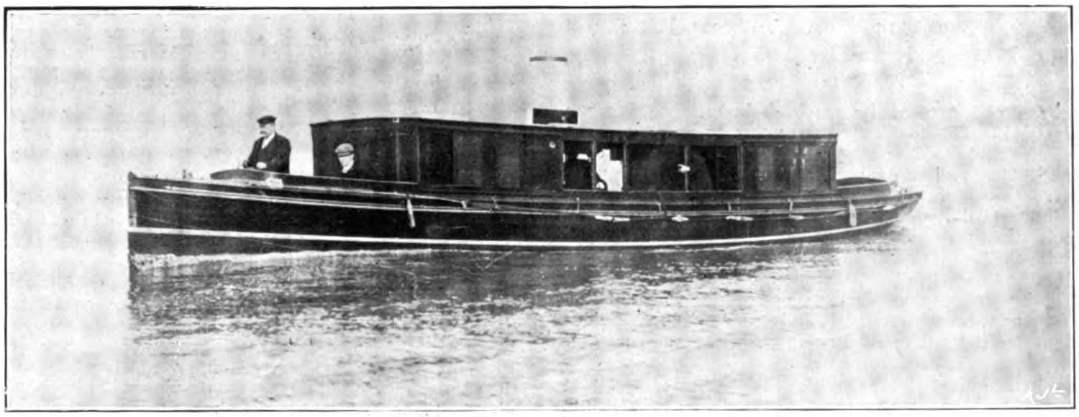
Transport in the Colonies.

THE need of transport, which, as we have on more than one occasion pointed out, is frequently such a terrible handicap to the development of out of the way mining districts, seems to be felt with special stress in the mineral zone of British Columbia. Extended use, it would seem, is made of aerial cables and glissades down mountain slopes (when snow prevails). The adoption of these methods is suggestive as regards the state of affairs prevailing. There is a crying need of heavy motor transport. But, just as in Matabeleland, as we have already pointed out, the advent of the motor will have to be preceded by the advent of the road maker, and the road maker will require a considerable amount of capital.

Cyclist v. Fowl.

A CASE in which the misbehaviour of a fowl on a public road resulted in damages against its owner instead of for him, as is the usual occurrence, is reported from Axminster. An eccentric pullet flew out of a house just as a school attendance officer of Colyton was passing on his bicycle. Sudden contact with the fowl threw him over and damaged his bicycle, and a County Court judge gave judgment for the plaintiff, saying that people ought to learn to exercise proper "control over their stock, whether it was cattle, pigs, or poultry," and, *we* should like to add, children. In fact, the new Parliament would deserve the thanks of the community by passing a law which should make it punishable for parents to imperil their children's lives by allowing them to use the high-road as a playground.

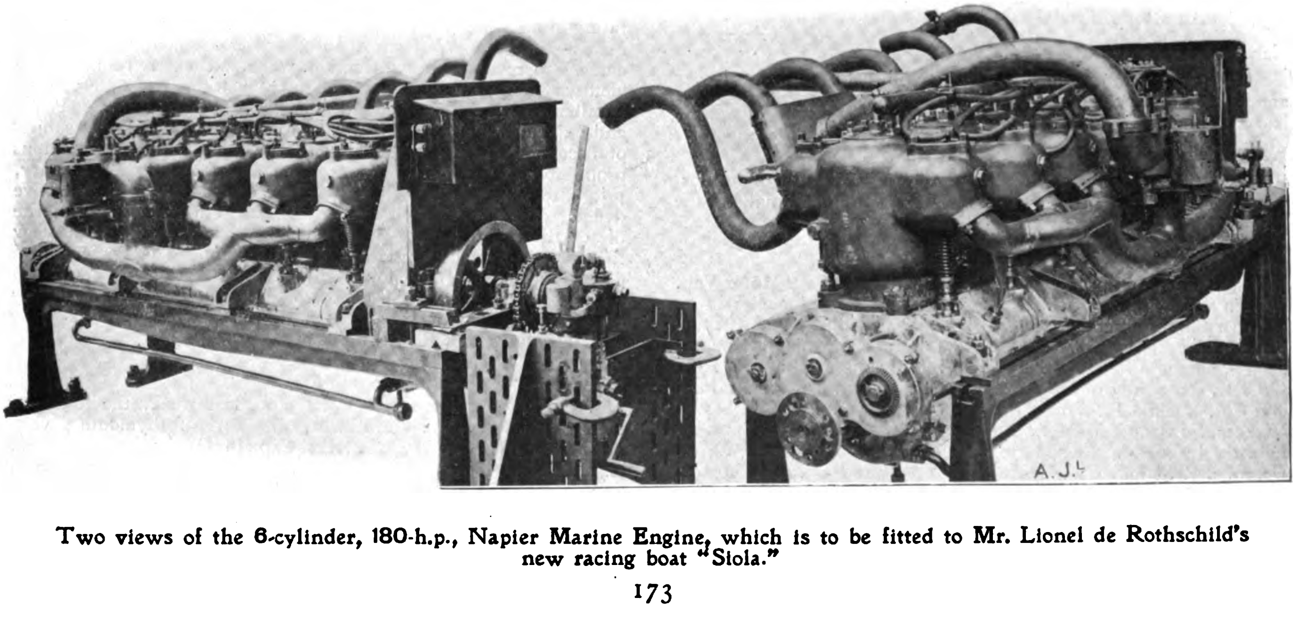
MOTOR BOATING.



A 55-ft. Thornycroft Motor Boat, built for the Governor of Nova Goa (Portuguese India). The boat is particularly roomy and has cabins fore and aft, the engine, a 6-cylinder 6 ins. by 8 ins., developing 78 b.h.p., being placed amidships. Paraffin is used as fuel. During a recent test the boat attained the satisfactory speed of 12 miles per hour, and is now on her way to Marmagoa. The principal dimensions are as follows:—Length, 55 ft.; beam, 8 ft.; draught 3 ft. 6 in.

Mr. Lionel de Rothschild's 180-h.p. Napier Motor Boat "Siola."

THE powerful 6-cylinder engine for Mr. Lionel de Rothschild's racing boat, "Siola," has now been completed, and we are able this week to reproduce two excellent photographs that clearly show its construction. It is essentially a marine motor, and has each cylinder formed by a separate casting, so that this engine is, to only a limited extent, designed on the same general Napier lines as the 60-h.p. car engine of which we gave a fully illustrated description quite recently. Its inlet-valves and exhaust-valves are of the same size as one another, but they are arranged symmetrically on opposite sides of the cylinders, with high-tension ignition-plugs fitted above the former. The induction-pipe is, moreover, designed with the object of rendering all the inlet-valves precisely equidistant from the carburettor, but it lies beneath the carburettor instead of above it, and the warm-air supply-pipe passes across above the cylinders. In spite of the enormous cylinder dimensions—8-inch bore by 5-inch stroke—the engine runs at a normal speed of 1,250 revs. per min. Special provision is made for protecting the valve-springs from salt water, all these springs being enclosed (though not so shown in our illustrations) by aluminium cases. Other features of this huge engine are the hollow nickel-steel crank-shaft, with bearings between each pair of cranks; the same type of oil circulation from a gear-driven pump as on the new 60-h.p. car engine, in addition to a pressure-fed drip-feed to the main bearings and a hand-pump to the crank-chamber; and the admission of water from the gear-driven pump into the jackets immediately around each exhaust-valve. Although the engine appears to be quite easy to start by hand—by the use of a prising bar—a 4-h.p. motor is fitted to it, as seen in the photographs; a disc clutch, and a double reduction gearing are interposed between the small single-cylinder engine and the large engine. Overall, the dimensions of this 180-h.p. machine are as follows: Length, 7 ft.; width, 2 ft. 2 in.; and height, 3 ft.



Two views of the 6-cylinder, 180-h.p., Napier Marine Engine, which is to be fitted to Mr. Lionel de Rothschild's new racing boat "Siola."

CLUBS AND ASSOCIATIONS.

A.C.G.B.I.

On Thursday, February 15th, Dr. W. Watson, F.R.S., will read a paper on "The Use of the Engine as a Brake."

Aero Club.

The club has now purchased a special balloon (about 50,000 cubic feet capacity) for the use of members; this balloon, built on the most modern and up-to date principles, is fitted with new type valve, rip cord, &c., and will accommodate four or five persons, according to length of journey, &c.

In addition to the balloon committee, it has been decided to form a technical committee on aerial locomotion, whose chief functions will be to advise the committee of the club as to the best means of encouraging and promoting in Great Britain the study and invention of machines of the heavier-than-air type, to organise competitions for aeroplanes, engined and otherwise, and to draw up the rules and regulations for the Salomons Prize. Also to examine and report on inventions submitted to the club.

It has been decided also to form a meteorological committee whose principal function will be to promote and carry on the scientific research of the higher atmosphere by means of meteorological observations and experiments from balloons and kites.

The Fédération Internationale Aéronautique has appointed the Aero Club as the recognised body representing aeronautics in the United Kingdom.

The next Annual Congress will take place at Berlin during the summer.

Aero Club Aeronautical Exhibition.

The Aero Club are organizing an Exhibition of aeronautical appliances, balloons, models, pictures of balloons and flying machines and other objects of aeronautical interest in connection with Messrs. Cordingley's Motor Car Show at the Agricultural Hall from March 24th to 31st.

The Secretary of the club will be glad to hear from any person who would be willing to exhibit or lend articles of interest. The club are prepared to defray the expense of carriage to and from the exhibition, and every care will be taken of articles lent or exhibited.

A prize of £10 in cash will be awarded for what in the opinion of the Committee is the best model or other exhibit in the Exhibition. Any further particulars can be obtained from the Secretary of the Aero Club, 110, Piccadilly, W.

Automobile and Cycle Engineers' Institute.

We learn from the Secretary of the Institute at Birmingham that at the request of those members of the Institute who are resident in or near London, it has been decided to form a London section of the Institute under the chairmanship of Lieut.-Col. Crompton, C.B.

The first meeting of the London section will be held on the 14th inst. at the Royal United Institution, Whitehall, London, and Colonel Crompton will read a paper on "Some Unsolved Problems in Motor Engineering."

This meeting will be an open one, and anyone interested can obtain a ticket for admission on application to the Secretary, at 109, Colmore Row, Birmingham.

Cardiff Motor Club.

At the first annual meeting of the club, held last week, it was announced that there is now a membership of 74, and the treasurer had a balance in hand.

Ladies' A.C.

"A Try for the Herkomer Trophy" is the title of an illustrated lecture which will be given by Mrs. Edward Manville at the Ladies' Club on February 22nd.

Motor Van and Wagon Users' Association.

The Association proposes to change its title to the "Motor Van, Wagon and Omnibus Users' Association," and now includes in its membership representatives of all the large trading and carrying companies. By way of example, the railway companies are represented, among others, by the Midland Railway, the G.W.R., the G.C.R., &c.; the carrying companies by Messrs. Carter, Paterson and Co., Messrs. Pickfords, &c.; manufacturing firms by Messrs. Vickers, Sons and Maxim, Stothert and Pitt, &c.; the brewing industry by Messrs. Bass, Ratcliffe and Gretton, Messrs. Watney, Coombe, Reid and Co., Messrs. Whitbread and Co., and Messrs. W. Hancock and Co., Ltd.; the milling industry by Messrs. Mark Mayhew, Ltd., Messrs. Whitworth Brothers, Messrs. F. Skurray and Son, &c.; and the omnibus companies by the Road Car Company, the London Motor Omnibus Company, &c.

In connection with the work of the Association, important new developments are in contemplation for the forthcoming year with a view to improving and securing the increased use of commercial vehicles. Particulars of the Association may be obtained from the secretary, Mr. Rees Jeffreys, 1, Albemarle Street, Piccadilly. Its membership is open to all firms using, or proposing to use, commercial motor vehicles, and any person interested in road transport problems.

North London A.C.

The joint committees of the Southern Motor Club and the North London Automobile Club have decided that the competition between the two clubs for the "Gamage" Challenge Cup shall take the form of a speed judging contest, to be held in May next, on the Bath Road. The North London Club announce a Cinderella dance, to be held on the 17th inst., at the Midland Grand Hotel.

Nottinghamshire A.C.

Mr. Charles Hardy, the president, occupied the chair at the annual meeting of the club on January 29th, when the report disclosed a substantial position, both as regards the balance of funds in hand and the membership, which stands at 166. Proposals were submitted by Mr. Barlow for the revision of the rules, making it impossible for any member concerned or "actively engaged" in the motor car industry to serve as an officer of the club. After a very animated discussion, in which it was contended that an arbitrary rule of this kind would do a grave injustice to members who were largely responsible for the inauguration of the club, it was rejected by an overwhelming majority. Mr. Charles Hardy was re-elected to the presidency; the vice-presidents chosen were Mr. E. W. Wells, Lieut.-Col. Birkin, Mr. B. W. Winter, Mr. G. H. Kirk, Mr. G. Cowen, and Mr. A. R. Atkey; Mr. Booth Granger was again elected hon. secretary and treasurer, with cordial thanks for his past services in these capacities; and the following were elected to serve on the committee: Dr. Hogarth, Dr. Buckley, Messrs. W. D. Wells, H. Rimington, J. J. Spencer, H. Belcher, M. Ross Browne, A. Barlow, W. D. Foster, and R. Cripps.

Society of Motor Manufacturers and Traders.

The offices of the Society are being removed to Maxwell House, Arundel Street, Strand.

The necessity for more commodious premises has arisen from the great increase in membership and the widening of the scope of the Society's work. The annual Exhibition is supplemented by general work for the protection of the motor industry. There are also sections dealing with commercial vehicles, marine motoring and components and tyres. The Society's new premises will provide a centre for its members where all motoring literature and works of reference will be at their disposal. A board room, capable of seating 200 persons, will be available for meetings.

Important Motor Trade Movements.

The Society of Motor Manufacturers and Traders, representing the British makers, have been specially active recently. They report that they have rendered assistance to the London Chamber of Commerce and other bodies in the Hunslet case respecting the rating of machinery. The Society also gave financial help in the case against the Western Road Carrying Company for special damage to roads by heavy traction, which ultimately resulted in a victory for the motor trade. The regulations respecting motor omnibuses, which are issued by the Chief Commissioner of Police and published by us in this week's Journal, have been the subject of discussion by a joint deputation of the Society and the omnibus proprietors, who laid their unanimous views before Mr. Henry, prior to his settling the various clauses. The prospective defence to the Renault patent claim to a monopoly on the direct drive for motors has been taken charge of with a view to protecting the interests of British makers. The Society have offered the Automobile Club a special prize for steam cars, to be competed for separately from petrol cars, in the Tourist Trophy race, and the important question of the petrol supply is now engaging the attention of the Society.

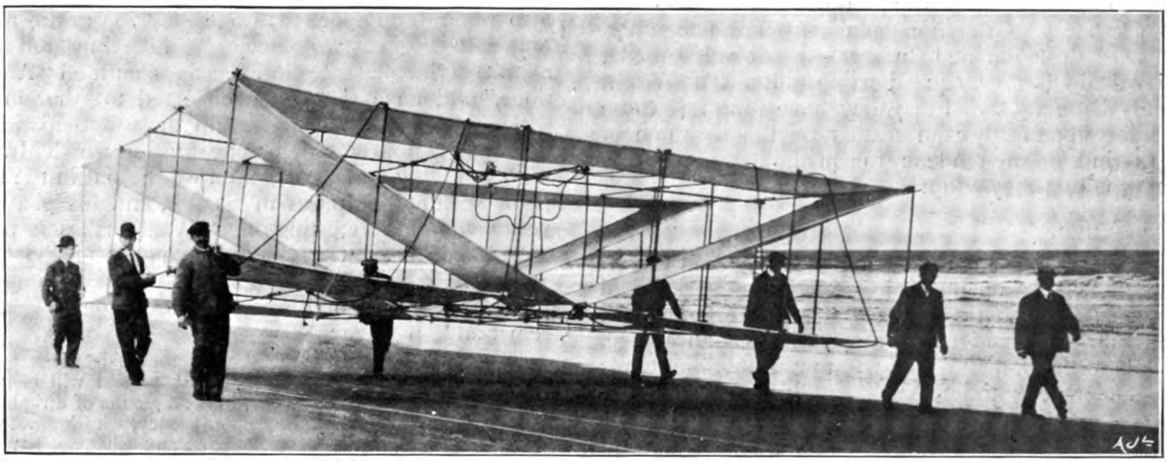
South Wales A.C.

At the annual meeting of the club, last week, the following officers were elected:—President, the Earl of Plymouth; vice-presidents, Mr. Godfrey L. Clark, Captain Hughes Morgan, Mr. C. H. Bailey (Newport), Mr. D. W. Graham (Ilston Park, Mon.), the Hon. C. S. Rolls, Mr. J. Colby (Boncath), and J. Thompson Willows; hon. treasurer, the Rev. Miles Whiteside; hon. secretary, J. Thompson Willows. The affairs and finances of the club were reported to be in a very satisfactory condition.

AERONAUTICS.

The Hamilton Aeroplane.

THE illustration which we give above, of a flying machine or aeroplane being marched along the Ormond-Daytona Beach, possesses a special interest of its own, as it shows the Hamilton aeroplane before it met with the very serious accident to which it fell a victim, though the aeronaut who was mounted on it escaped with great good fortune practically uninjured. We reproduce the photograph for several reasons. One of them is that we described the experiment and the resulting accident on the 27th of January last, and it may prove of interest to our readers to see how a machine, with which an actual experiment has been made, is constructed. It will be noted from the way in which the Hamilton aeroplane is held aloft by those marching it along, how light it is, and how it almost seems to float in the air, and this is the sort of thing that a photograph, and only a photograph, can show. There is, however, another reason why we reproduce the photograph. The arrangement of surfaces adopted in the Hamilton machine is, we believe, open to criticism. Of course, as we pointed out when referring to the experiments on the Ormond-Daytona Beach, and on other occasions also, it is very doubtful whether much can be learned from mere towing, which was being done with the Hamilton aeroplane when the accident occurred. We know quite well, and it has long passed out of the region of discussion, that an aeroplane, suitably shaped and driven by existing types of engines and existing types of propellers, will develop more than the necessary lift to maintain itself and a load in the air. That is no longer in dispute. It is in the manipulation of such machines successfully under *working conditions* that progress only has to be sought for, and it is in that direction only that progress is needed. We purposely emphasise the word "working" because towing experiments do not reproduce working conditions. The tow-rope provides not merely the motive power, but it provides stability as well. It is possible that the effects of rudders might be tested on a towed aeroplane to a certain extent, but only to a certain extent, and we question whether the knack of absolutely controlling the machine would in this way ever be learned at all. It may not at first sight be apparent to everyone how the tow-rope can give stability, but a moment's reflection will show that if at any moment the towed aeroplane tends to deviate from the definite direction which the tow-rope would give it, the tendency to restore it to that position goes on increasing and increasing till it is brought back to that direction. This is the exact opposite of the state of affairs that occurs when an aeronaut is controlling or attempting to control a free aeroplane, whether a gliding machine or a motor-driven one. The more he allows the machine to be deflected from its proper position, the more difficult would it be to get back into it, and it was this peculiarity of apparatus of the kind that was responsible for the deaths of Lilienthal and Pilcher.



The Hamilton Aeroplane being "marched" along the Ormond-Daytona Beach. It is with this machine that the experiments referred to on this page, and in our number of the 27th January, were carried out.

For the Sake of Criticism.

TOWING, therefore, provides no true test, and that brings us to the third reason for our reproducing the photograph, viz., for the purpose of criticism. We do not believe that the type of machine shown is ever destined to attain success in free flight without undergoing very considerable modification. It may act as a successful kite, in fact it has been proved to do so, but, as pointed out above, this is a very different thing from being a successful flying machine. Our views may be ultimately shown to be wrong. In a subject of such uncertainty, dogmatism is unwise, but the principles involved in the Hamilton aeroplane conflict with those which we are at present of opinion are the right ones. Even if subsequent experiment shows our views to be incorrect, we cannot avoid the belief that the science of aeronautics is likely to benefit from any *bona fide* criticism of the various types of machines proposed.

Why its Design is Open to Criticism.

IT will be remembered that the type of machine with which, in the first place, Mr. Chanute, and in the second place the Wright Brothers, have accomplished their successful glides, consisted of two aeroplanes, or, to be more correct, aerocurves, superposed and connected together by struts and ties on the lattice-girder principle. An attempt to improve this form of construction was made by M. Archdeacon in France, who adopted an arrangement of a similar nature, but added to it a couple of superposed aerocurves some distance behind it—the rear pair being rigidly connected with the front pair. This form has never been approved of, either by the Wright Brothers or by Mr. Chanute, the former holding the view that it diminishes the controllability, and M. Archdeacon's experiments with it, either for gliding purposes or when towed by boat, have been so unsatisfactory that we think the imperfections of this type of machine have been fully demonstrated. It is true that the Langley machine, a model of which executed a free flight of about a mile on the Potomac River, was built on these principles, but the results obtained with models (as has been pointed out often enough) are apt to be very misleading, and the Langley machine, as soon as built large enough to carry an aeronaut, made a signal fiasco of its only attempted flight.

Inclined Surfaces of Doubtful Utility.

SECONDLY, it will be observed that the Hamilton aeroplane, in addition to the top and bottom aerocurves, has inclined surfaces assisting in bracing the top and bottom surfaces of the horizontal aeroplanes together. The use of these inclined surfaces—the di-hedral angle, as it is called—is of very questionable utility. The Wright Brothers distinctly stated that they have found it to be satisfactory in perfectly calm weather, but that the moment there is wind, or any tendency to squalliness, it is inferior to the type that they adopt.

Other Faults.

BUT the Hamilton aeroplane does not adopt the di-hedral angle fairly and squarely. It sticks the inclined surfaces in between two horizontal surfaces, by which means they are deprived of their principal advantage. The idea of the di-hedral angle is that if anything tends to upset lateral equilibrium, such as a sudden gust of wind, if one side is lifted the tendency to lift on that side is diminished, while the other side is brought more horizontal. The pressure underneath it accordingly increases, and so there is a tendency to a restoration of equilibrium. This effect very largely depends on the inclined surfaces being free, and, as may be observed, in the Hamilton machine this is far from being the case. The diminishing upward pressure on say the left inclined surface as the machine tilts say to the right, is interfered with and diminished by the surface underneath it, while the pressure underneath the right-hand inclined surface, which should correspondingly increase, is prevented from fully doing so for precisely the same reason. At the same time the juncture of the surfaces forms solid angles at the sides of the machine, and data exist amounting almost to proof, that the presence of such solid angles is harmful. The apparatus, it will be seen, has neither a rear nor forward tail. There is nothing, as in the Wright machine, to raise or lower it, restore longitudinal horizontality if upset, or to enable it to turn either to the right or to the left so as to restore horizontality. These omissions suffice to show that the machine was and could only have been used as a man-carrying kite, to which the tow-rope supplied not only the lifting and propelling, but also the guiding force. Of course, it may have been that the experimenter intended to see what it felt like, up above, in a machine of the kind. But the absence of the controlling apparatus, to which we have drawn attention, is alone sufficient to explain the accident, if we merely suppose a little inattention or want of judgment on the part of the motorist towing. The experimenter had nothing in fact by which to control the height of his machine in the air, and the height to which it flew depended, of course in consequence, solely on the speed of the car and on the wind. If the motorist had been a careful man and, noticing that the aeroplane was going too high, had slowed down the car, nothing might have happened. But the aeronaut was at his mercy.

Whether our criticism is correct or mistaken, further experiment alone will show, but if it is found, as we believe it will be, that it is practically impossible to execute glides or free flight with a machine of this type, our views will have been shown to be correct. In any case, as we have previously remarked, we think little is to be learned from mere towing by a motor car.

A Prophecy and Its Realisation.

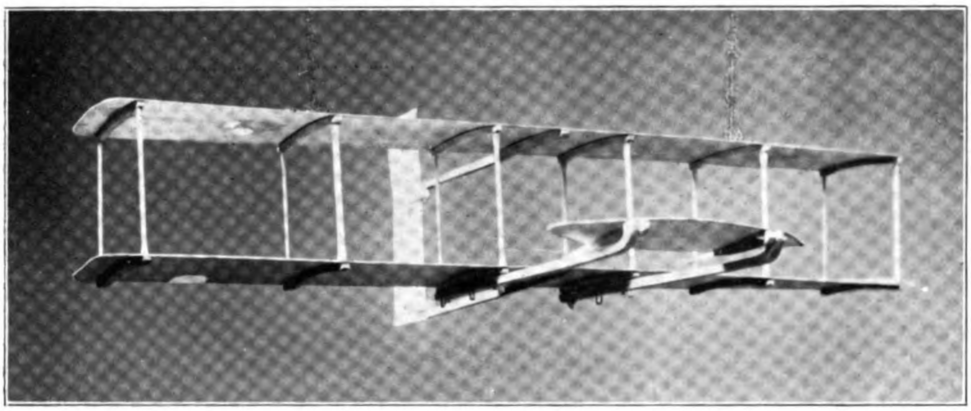
FROM time to time we have referred to the very pregnant suggestions relative to the future developments of aerial navigation put forward by Mr. H. G. Wells in his novels and imaginative tales of the future. We have also referred on more than one occasion to the remarkable collection of "prophecies" which appeared first of all as a series of articles in magazines, entitled "Anticipations," and have since been collected together in book form. It is noteworthy that in these anticipations the principal, if not the only practical use to which Mr. Wells seems to think aerial navigation will be put in the future, is for scouting purposes in warfare, and his picture is a very vivid and interesting one. What makes it particularly interesting is that since the chapter on the subject was written, one of the prophecies that it has contained has been already fulfilled. We refer to the following remarkable passage:—

> "I am inclined to think that the many considerations against a successful attack on balloons from the ground will enormously stimulate enterprise and invention in the direction of dirigible aerial devices that can fight. Few people, I fancy, who know the work of Langley, Lilienthal, Pilcher, Maxim, and Chanute, but will be inclined to believe that long before the year A.D. 2000 a successful aeroplane will have soared and come home safe and sound. Directly that is accomplished the new invention will be most assuredly applied to war."

When writing this, Mr. Wells had obviously never heard of the Wright Brothers' and the other important experiments which have been made during the last year. In fact, the first part of the prophecy, as we say, has already been fulfilled. It may therefore be of interest to readers of our aeronautical column to be reminded of the picture of the first operations in a future war, to which Mr. Wells has committed himself.

> "The fight between flying-machine and flying-machine, as we are trying to picture it, will be a fight of hawks, complicated by bullets and little shells. They will rush up and up to get the pitch of one another, until the aeronauts sob and sicken in the rarified air, and the blood comes to eyes and nails. The marksmen below will strain at last, eyes under hands, to see the circling battle that dwindles in the zenith. Then, perhaps, a wild adventurous dropping of one close beneath the other, an attempt to stoop, the sudden splutter of guns, a tilting up or down, a disengagement. What will have happened? One combatant, perhaps, will heel lamely earthward, dropping, dropping, with half its bladders burst or shot away, the other circles down in pursuit. . . 'What are they doing?' Our marksmen will snatch at their field-glasses, tremulously anxious. 'Is that a white flag or no?' . . 'If they drop now we have 'em.'"

Of course the reality may be quite different, but it is strikingly like Tennyson's similar vision about "The airy navies of the future grappling in the central blue," and prophecies by a prophet who has been successful even in a single prophecy, stand on a different level from most other utterances of the kind.



We are now able to reproduce, above, a photograph of the 40-inch Aeroplane Model promised by Mr. A. V. Roe in his letter to us, published on January 27th last. It is, as will be noticed, constructed on the lines adopted and developed so successfully by the Wright Brothers, and is fitted with its horizontal and vertical rudders. The extreme length of the aeroplane surfaces is 40 inches, their width is 6 inches, and they are 6 inches apart. Some interesting experiments having already been made by Mr. Roe with this model, he is now building a similar model of considerably larger size, after which he hopes to be able to make arrangements for building a practical motor-driven machine.

The Polar Airship.

The construction of the airship which is being built by M. Godard for Mr. Walter Wellman, the American explorer, and with which he intends to attempt to reach the North Pole next summer, is proceeding rapidly, and there is every reason to suppose that it will be ready at the time agreed upon. This machine, of which we hope to give some further details next week, is to be fitted with a 15-h.p. motor, and is calculated to attain an average speed of about 18 miles an hour.

Experiments at Aldershot.

Experiments with man-lifting kites are being carried out under the supervision of the military authorities on Laffan's Plain at Aldershot. The authorities are said to be very well satisfied with the results obtained, and Mr. Cody, with whose patent kites the experiments have been made and who has conducted them himself, on one occasion succeeded in rising as much as 26,000 feet into the air.

American Aero Club's Exhibition.

Of much interest to those interested in aeronautics was the subsidiary exhibit organised by the newly-formed Aero Club of America, which was held in connection with the Sixth Annual Automobile Show at the 69th Regiment's Armoury. Here were to be seen all sorts of machines, some of which, like Langley's, had actually flown by themselves, and, like one of the Lilienthal machines, had sustained an experimenter in the air in actual gliding flight. The principal exhibit was, in fact, the Langley aeroplane, which executed the longest free flight on the Potomac River ever accomplished by any machine of the heavier-than-air type without an aeronaut on board. There was also Professor Bell's tetrahedral kite, which is a wonderful multi-cellular arrangement looking not altogether unlike an elongated and greatly magnified chunk of honeycomb with the cells open and the honey taken out. It is provided, however, with front and rear tails similarly constructed, and is said to possess such stability that when launched from a balloon in mid-air it descends in a series of curves, sometimes going round in a complete circle like a soaring bird. Further exhibits of interest were the Herring dome kite, which is much like an enormous hat with a tail to it. One of the Lilienthal machines with which Lilienthal executed certain glides (though the longest and most frequent were accomplished with his multi-cellular machine) was shown, as well as the motor and part of the hull of Santos Dumont's No. 9. Models also of machines not differing noticeably from the accounts of the Wrights' motor-propelled machine were, in addition, exhibited.

The Vuina Aeroplane.

Experiments with the flying machine of M. Vuina, to which we referred last week, are still being carried out at Montesson. The arrangement, which consists of a pair of enormous wings and a motor-driven propeller, runs on a light quadricycle frame, which the propeller has proved itself able to drive at a considerable speed, and even uphill. The apparatus, however, has not yet risen in the air.

* * * *

Motor Samaritans.

Owing to the active co-operation with the police of the Automobile Association scouts, in many districts the trappists have ceased from troubling, and thus enable the bicycle scouts to be of further use to motorists by rendering them assistance in breakdowns. Last Sunday we heard of several such incidents on the Brighton road alone. Scout A.A. 5 was very practical in helping a stranded motorist over his ignition troubles, and A.A. 4 without any demur rode some miles to the Old Ship, Brighton, and secured help for an owner whose car had been rendered *hors de combat* by the roadside. Little acts of this sort refute the statements which have at times been made to the effect that the A.A. scouts, by their action, only assist scorchers in their malpractices.

Automobilism at the Antipodes.

Evidence of the great interest awakened in Australia by the Melbourne-Sydney Reliability Trials, which we described very fully at the time they were held, is provided by the fact that our contemporary, the *Scientific Australian*, devotes practically the whole of its Christmas number to automobile topics.

PUBLIC MOTOR VEHICLE REGULATIONS.

REVISED rules have now been issued by the Commissioner of Police as to conditions for proprietors obtaining a certificate of fitness for motor omnibuses for the Metropolis. On December 9th THE AUTOMOTOR JOURNAL published the suggested regulations which have since been revised after consultation with the representatives of the industry.

A recommendation by the Commissioner is that proprietors before entering into contracts for new types of motor omnibuses would do well to send the drawings to New Scotland Yard for approval as to type.

It is also specially added in a covering clause that the police conditions may have been complied with, yet, if there be anything in the construction, form, or general appearance which, in the opinion of the Commissioner, renders the carriage unfit for public use, it will not be licensed.

The following are the revised conditions which specially apply to mechanical vehicles. There are in addition the usual provisions in regard to space for passengers, display of fares, proprietors' names to be painted, lighting, &c.: —

Carriages must be submitted for inspection in a thoroughly good condition, and no carriage will be certified fit for public use unless it is newly painted and varnished. The following conditions must also be strictly complied with :—

1.—Stage carriages propelled by mechanical means, and subject to the Light Locomotives Act (59 and 60 Vict., cap. 36), and Motor Car Act (3 Edwd. VII., cap. 36), must comply with the requirements of those Acts and of the Orders of the Local Government Board made in pursuance thereof.

2.—Each new type of motor car, intended for licensing, must be presented at New Scotland Yard for inspection. The proprietor must, at the same time, produce the certificate of registration, and also one from the maker stating the machinery to be safe and in every way fit for use in a public carriage.

If, on inspection, the car is approved such approval may extend to all cars of that description, and cars of that type need not be again presented at New Scotland Yard; but may be taken to the usual passing station, provided a certificate from the maker is submitted with each car for licensing, stating that it is in every respect similar to the type already approved.

A certificate from the proprietor, stating there has been no alteration in the design of the machinery since the previous inspection and date covered by the maker's certificate, must be presented with each car submitted for renewal of licence.

Should an alteration be made, the same course may be required as for a first inspection.

Should it be deemed necessary, an expert will be employed to advise on the subject. The fee for the expert examination to be deposited by the proprietor with the Commissioner, which fee will be returned if the car is passed without alteration being required.

3.—The following measurements and requirements for an omnibus with top deck seats must be adhered to, and the number of passengers to be provided for on such vehicles must in no case exceed sixteen inside and eighteen outside :—

Chassis.

Length.—Not to exceed 20 ft.; but if the platform is carried on the frame the total length may be 23 ft.

Clearance.—The front axle and all the underworks of the car inside the knuckles of the steering joints (provided they are placed as near as possible to the wheels), as far back at least as the rear axle, must clear the ground at least 10 in. when the car is fully loaded, allowing half-an-inch in addition for new tyres to provide for wear.

Wheel Base.—Should not exceed 14 ft. 6 in., and it should in all cases be so proportioned that skidding or other improper movements shall be as far as possible avoided.

(NOTE.—The Commissioner reserves the right, even after a car has been passed, if it is found to be apt to skid unduly, to issue a notice on the proprietor not to use, and may refuse to license again until the defects have been remedied.)

Springs.—The springs must be properly hung, of sufficient strength and flexibility, to meet all purposes which may be required of them. Those springs carrying the load must be attached to, or bear upon the back axle, as near to the wheels as possible, the distance between the outsides of the rear springs, shall not be less than 45 in. The front springs must be as wide apart as possible, but not less than 38 in. from outside to outside. Where a cross spring is used, it must be so applied that it shall not cause or increase side sway.

Wheel Track.—Centre of must not be less than 5 ft. 6 in.

Body.

Height.—Inside, minimum 5 ft. 10 in., maximum 6 ft. Outside, from ground to spring of roof, 9 ft. Outside, from ground to centre of roof, 9 ft. 3 in.

Camber.—The camber should not be more than 3 in., but may, if the proprietor so desires, be made up to but not exceeding 5 in., provided the outside of roof is so constructed as to give an equivalent in all respects to a 3-in. camber, and the height from the ground is not in any way increased.

Guard rails.—The side guard rails must be 3 ft. from roof and 18 in. above the seats. The front and back guard rails must be 3 ft. 3 in.

Width.—Inside between seat backs not to be less than 56 in.
,, From off hind roof seat to back rail, minimum 26 in.

Steps.—Where more than one is used the staircase handrail must reach to the centre step, and be properly and rigidly fixed.

Length of Platform.—Not less than 36 in. nor more than 42 in.

The total overall length of the chassis and body must in no case exceed 23 ft., nor the extreme length be greater than 7 ft. 2 in.

Note.—Omnibuses which carry a less number of passengers than thirty to be made in proportion to the foregoing measurements as to length; but the number of passengers carried upon the outside must not be in greater proportion than seven to six inside.

4.—No canopy or other similar superstructure will be permitted on the roof of omnibuses constructed to carry passengers on the top deck.

5.—Each carriage must be fitted with at least two independent brakes of sufficient strength that either of them is capable of stopping and holding the carriage under all conditions.

NOTE.—The maintenance of the brakes in perfect order is of the utmost importance, and this will at all times be insisted upon. They will at any time be subject to inspection.

6.—Each car must be capable of being readily steered and able to turn a corner without unduly interfering with other traffic.

7.—The steering arms, &c., to be of sufficient strength, and as far as possible protected from damage by collision.

8.—The machinery should be so constructed that no undue noise or vibration is caused, and the maintenance of the carriage in this condition will be strictly enforced.

9.—Effective means must be adopted for the radiation of heat, and cooling of the parts subject to heat.

10.—All wires carrying electric current to be sufficiently insulated and placed so as to be free from danger.

11.—Tanks for petrol or other liquid fuel must be made of suitable material, properly constructed, and of sufficient strength. They should be so placed that any overflow shall not accumulate on woodwork, or where it can be readily ignited. The filling nozzle or inlet for the petrol or other liquid fuel should, where possible, be brought to the outside of the body.

12.—Suitable appliances for extinguishing fire should be carried in such a position as to be readily available for use.

13.—Driving chains and sprockets to be protected by a suitable guard.

14.—Head lights of great brilliancy will not be permitted.

No celluloid or xylonite fittings to be placed inside or outside, but this does not apply to the inside of accumulators.

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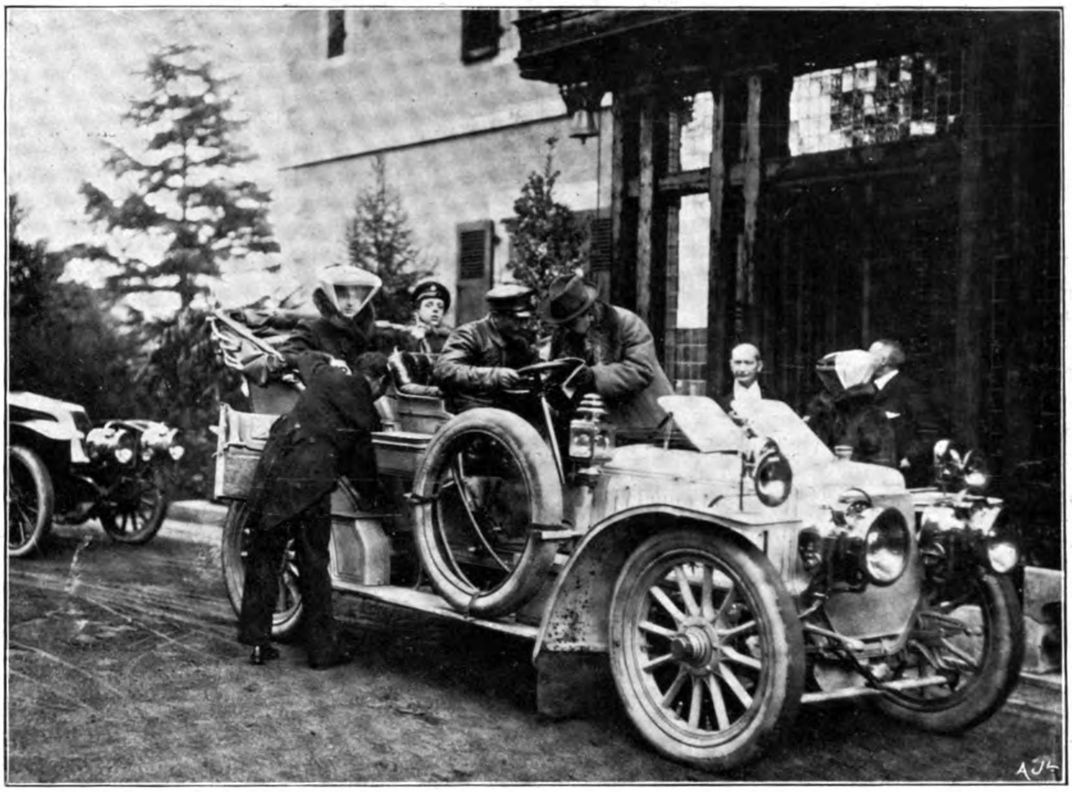
The Car of Cupid.

KING ALFONSO's motor car continues to render him such excellent service in his journeyings to and from Biarritz that the peasantry of the district have dubbed the Royal automobile "Cupid's car," and some of the natives have even been moved to write poems on the inspiring subject. We are able this week to give photographs of the King, Princess Ena, and the Queen Mother *en automobile.*



The King of Spain and Princess Ena of Battenberg just off for one of their daily motor drives from Biarritz.

Motor-Driven Fire Engines for Straits Settlements.

FOR use in hot climates, Messrs. Merryweather consider that the steam-propelled fire engine, such as their "Fire King" type, of which we have given full particulars in this Journal, is preferable to the petrol engine, of which they are also making large numbers. It is interesting to note that the Selangore Fire Brigade has had a steam fire engine in regular use for over three years, and Messrs. Merryweather have now supplied a similar machine for Penang. Ordinary petroleum is burnt in the furnaces under quick-steaming water-tube boilers, and a small gas or oil heater is temporarily used in the station, so that the engine can be turned out in under a minute in the event of a "call." The facilities for starting from cold, possessed by the petrol engine, are, of course, obvious, and in many cases this alone would act as a heavy balance in their favour. In tropical climates, however, it is easy to understand that the free use of petrol in a fire station is not desirable, but the Singapore and Penang brigades are to be congratulated on having self-propelled engines, all the same.

Enterprise by the M.F.B.

LONDON is also keeping abreast of the times, and the Metropolitan Fire Brigade have just acquired another "Motor Fire King," the trials of which were successfully carried out at the Southwark headquarters, under the superintendence of Mr. Gordon. As a test the machine was taken for a 70 mile run; it is geared to 30 miles per hour and can climb almost any hill at about 10 miles per hour, its pumping capacity is 500 gallons per minute.

More Cars for Bishops.

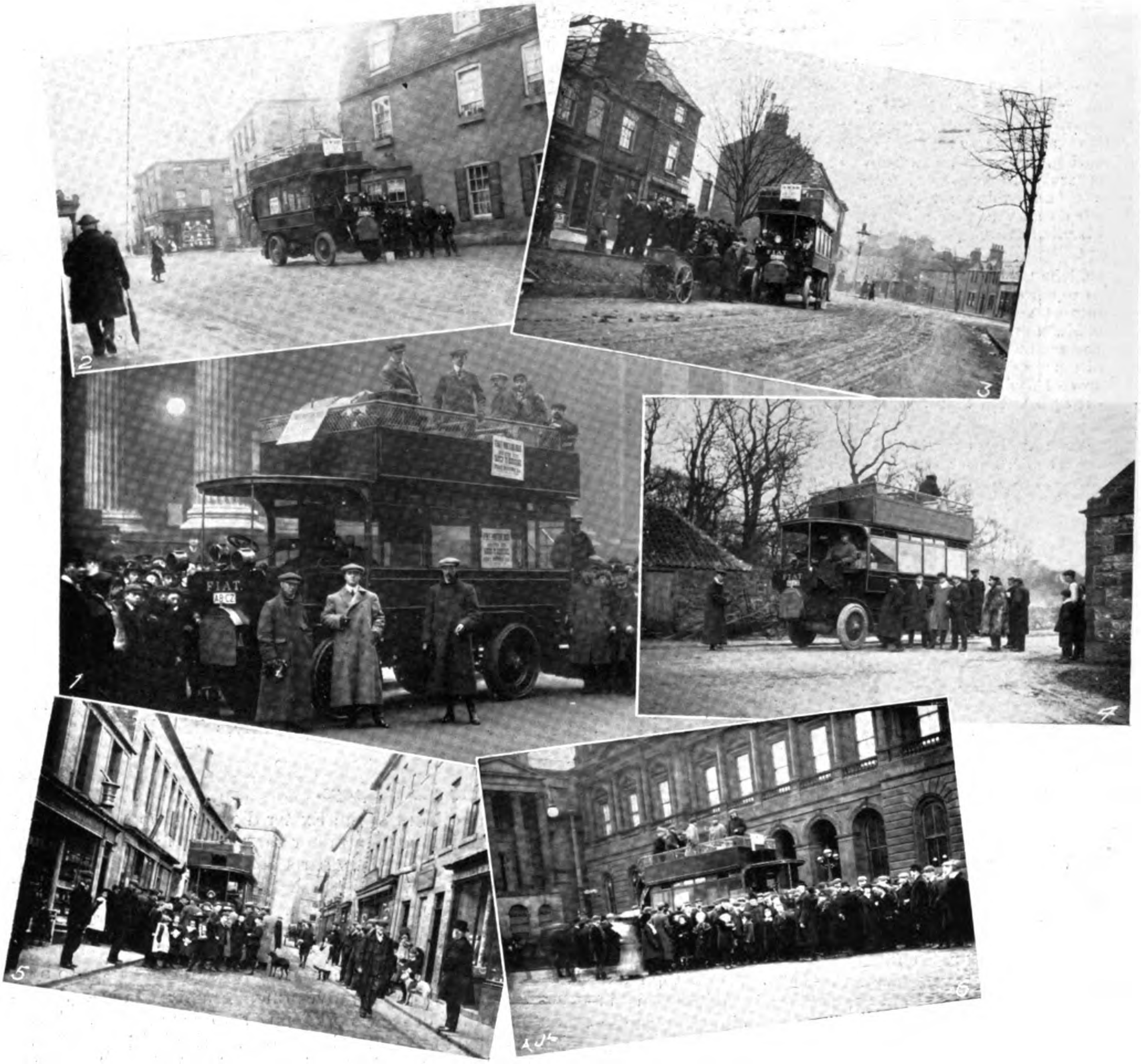
CHURCHMEN in the Exeter diocese propose presenting the Bishop with a motor car to enable him to reach more readily the remote parts of his see. In the diocese there are nearly 500 parishes, many of which are far distant from a railway station.

Co-operative Garages.

IN America, the proposal for arranging a garage to be organised upon co-operative principles amongst the leading automobilists of New York, appears to be maturing. It is to be called the "Club Garage of America," with premises in 62nd Street and Broadway. The A.C. of America have deemed it advisable, coincident with the "Club Garage" announcements, to issue a notice calling attention to the fact that there is no connection between the new garage and the A.C.A. Garage, which is now being built independently for the Club.

Mr. Charles Jarrott—hys Booke.

MR. JARROTT has arranged to write a book dealing, amongst other things, with automobilism in the early days, his experiences in connection with earlier types of cars and machines, and also his experiences on the road in the big Continental races in which he has taken part. The book will contain a chapter on motor cycling and motor cycle track racing, and an account of the disastrous Paris-Madrid race, in which Mr. Jarrott played so prominent a part. The book, which will be fully illustrated, will be published by the firm of E. Grant Richards, 7, Carlton Street, S.W., at half-a-guinea. Such a store of motoring experiences as Mr. Jarrott's should make the work cheap at double the price.



Photos by Wakefield, Brentford.

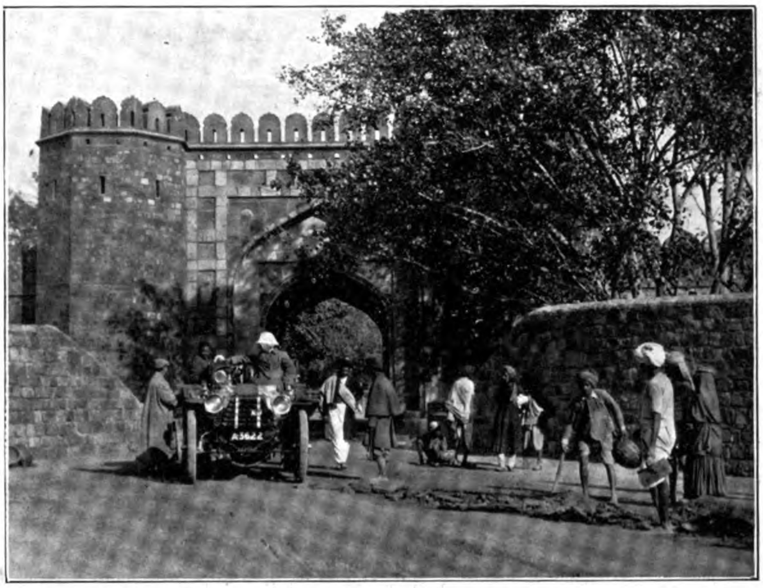
FROM LONDON TO EDINBURGH BY MOTOR OMNIBUS.—The run of the Fiat 'Bus on January 26th constitutes an unique record for such a performance. The above series of photographs secured by Mr. Wakefield, who accompanied the 'bus throughout, at various points en route, form an interesting souvenir of the journey. Our photographs, respectively, are taken at—1, the General Post Office, London (the start); 2, Biggleswade; 3, Grantham; 4, Morpeth; 5, Berwick; and 6, the General Post Office, Edinburgh (the finish).

Motor 'Bus Titles.

Some time ago we drew attention to the manner in which the companies running motor 'buses are reviving the old custom common in London in the early days of the horse 'bus and in the times of stage coaches, of employing special catch names for different services. Already we have had the "Vanguard," the "Arrow," the "Dart," and the "Pioneer"; now the "Victoria," the "General," and the "Union Jack" have been added, special interest attaching to the latter brand by reason of the fact that the first Clarkson steam 'buses in the Metropolis are serving under that banner.

Motoring in the Himalayas.

Describing a trip in the Himalayas, a correspondent in the *Pioneer* states that he believes his experience to have been the first motor climb in these famous mountains. The run was made in an 8-h.p. De Dion-Bouton car from the Dhukrani Estate, Western Dun, to Chakrata and back again, a total distance of 72 miles, which were covered in 7 hours, including all halts. Dhukrani is 1,300 ft. above sea level, and Chakrata close upon 7,000 ft., and the road for the last 15 miles of the upward journey is described as appearing "rather like a goat track, winding so steeply round impossible looking corners."



Reminders of Mr. C. J. Glidden's long touring trip are reaching us from time to time as postal opportunities serve. Our photograph shows Mr. and Mrs. Glidden and their Napier, A.3622, at the Cashmere Gate, Delhi. He has driven his car 5,000 miles in India since landing at Bombay—a longer distance than any other touring automobilist has hitherto accomplished in the Indian Empire.

Municipal Progress.

THE Chelsea Borough Council have decided to start a service of ten motor dust carts in the Borough at a cost of about £10,000.

A State Car.

IN one respect, at any rate, the colony of Australia is ahead of the mother country. The State of Victoria has adopted a state motor car, which is placed at the disposal of the Premier. This has enabled him to inspect many hundreds of miles of territory. He is so pleased with the vehicle that, on one occasion, he covered some ten miles in 15 minutes, there being, presumably, no law in the colony to prevent his doing so.

New Yorkshire 'Bus Services.

GASSINGTON, Keighley, Bolton, Skipton, Ilkley, and Addingham are, we understand, shortly to be served by motor omnibus services from Silsden as a centre. Vehicles capable of seating 36 passengers will be supplied to a Yorkshire company by the Scottish Motor Engineering Company, and will be British-built throughout. Slow speed (max. r.p.m. = 700) 4-cylinder engines capable of developing about 36 h.p. will be fitted to these cars, and the control mechanism will be simplified as much as possible. Sliding-spur-wheel change-speed gearing will not be used, for a type in which the gear-wheels are always in mesh has been designed instead. Side-chains will be adopted as the final transmission to the road-wheels, and the normal gearing will provide three alternative speeds of 3, 6, or 12 miles per hour respectively.

Importers Combine.

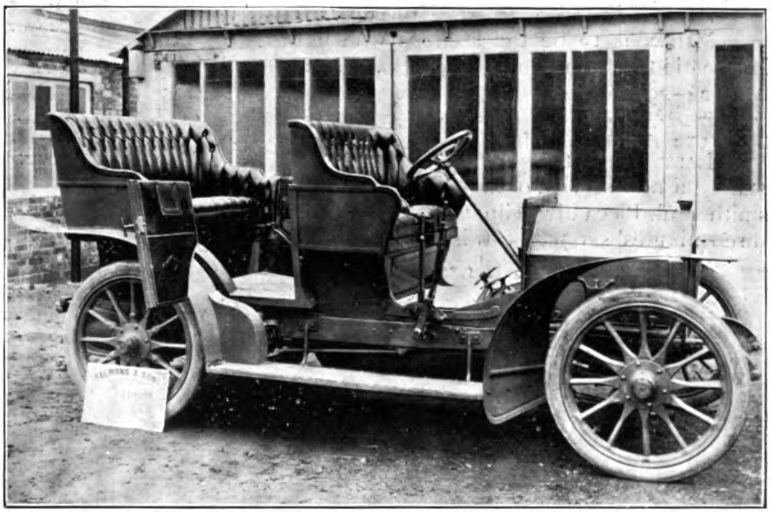
MOTOR car importers have formed an association, under the title of The Importers' Protection Association, for the guarding of their combined interests.

The Motor in the Malay States.

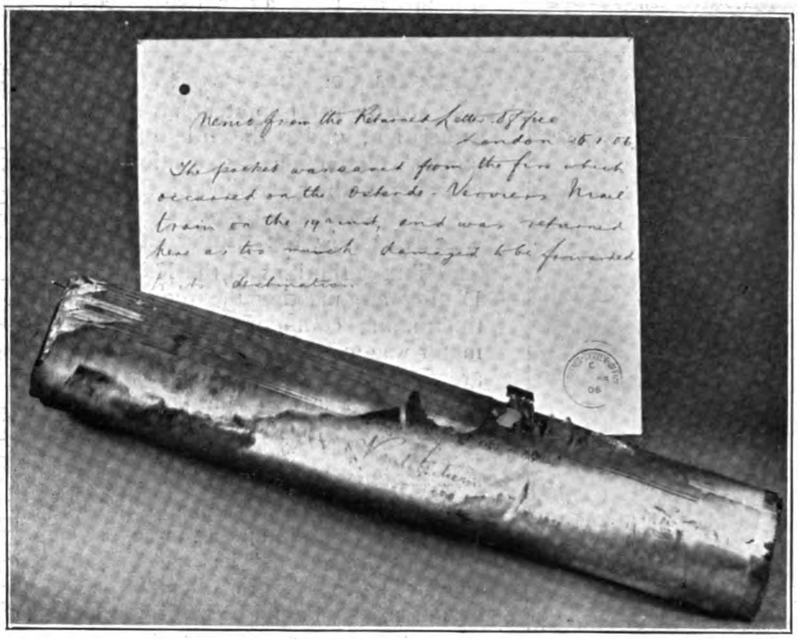
THE authorities of the Kuala Lumper District are meeting the requirements of the mining community by purchasing a motor wagon for transporting metal. They are following this departure up by completing the roads to Ginting Simpah and Petaling.

An Ingenious Camera Stand.

A NOVEL form of camera stand, which is being put on the market under the name of the "Swingcam," has been submitted for our inspection. It is ingenious in construction, and should prove of considerable value to photographers, whether amateur or professional, especially those engaged in engineering work. It is capable of every possible movement, and can be placed so as to direct the camera in every conceivable position. The normal height is 5 ft. 9 ins., but with extension bars, which can be supplied with it, the camera can be placed as high as 7 ft. 3 ins., enabling the most varied work possible to be carried out.



For some time a very realistic series of cinematograph pictures have been a feature at the Palace Theatre, depicting the building of a motor car in every detail, from the commencement to the finish, in (on the screen) the record time of about four minutes. Such celerity can hardly be expected in actual practice, but a smart piece of work in carriage body-building is related to us in connection with the above photograph by Messrs. Charles Jarrott and Letts. They write as follows:—"At 6 o'clock on Saturday morning last we despatched to Messrs. Salmons and Sons, coachbuilders, of Newport Pagnell, a 12-15-h.p. De Dietrich chassis, to which we required a body fitted, the car complete to be sent to the Edinburgh Exhibition. The chassis left London at 6 o'clock on Saturday morning, and arrived at Messrs. Salmons and Sons at 10.15, and shortly after 10 o'clock the same night, that is, just 12 hours later, the body was mounted and fitted with wings, steps and everything complete ready for the road, and the car complete was sent up to Edinburgh by the next train."



Recd from the Returned Letter Office
London 26.1.06.
The packet was saved from the fire which occurred on the Ostende-Verviers Mail train on the 19th inst, and was returned here as too much damaged to be forwarded to its destination.

A relic of the Ostende-Verviers Mail Train Fire. The Post Office is often unjustly blamed for delay and carelessness in handling letters and parcels. The other side of the picture is seldom presented. An instance of the latter is the return to the Automotor office of the copy of the Journal which we reproduce in the above photograph with its covering official note from the G.P.O. It is another case of the "yellow cover" identification. Practically no printing or address could be deciphered, but the "yellow cover" gave the clue and with commendable promptness the "packet" has been returned to us for our information.

Third International Congress.

MILAN is to be the scene of the next and Third International Automobile Congress. The date fixed is May 24–29th.

A "Rapid" Service.

LAST week the Rapid Road Transit Company started a new service of motor 'buses between Hammersmith and Piccadilly Circus. They intend making a three-minutes' service on this road.

Motor Launches on the Thames.

A JOINT deputation of the Society of Motor Manufacturers and Traders, the Marine Motor Association, the Motor Boat Club, and the Motor Yacht Club, will shortly wait on the President of the Board of Trade for the purpose of putting before the Board objections to the proposed bye-laws and regulations for motor launches on the Thames, drafted by the Thames Conservators. Full particulars of the bye-laws in question were published in the pages of this Journal, on September 16th last. It will be remembered that, although for the most part of an irreproachable character, some of them appear to be unnecessarily stringent.

Edinburgh 'Bus Service.

THE Scottish Traction Company, which was formed last autumn for establishing motor 'bus services in Edinburgh and other districts, has just received its first motor 'bus from the Maudslay Motor Company.

COMMERCIAL POINTS.

The Panhard and Levassor Travelling Workshop.

THIS popular van is about to start out on another tour. During the next few weeks it will visit the following districts:—Hants, Wilts, Dorset, South Devonshire, Cornwall, North Devonshire, Somerset, Gloucester, Worcester, Hereford, Montgomery, Shropshire, and Warwick. Actual date of the visit may be obtained by dropping a card to 14, Regent Street, London, S.W.

THE Continental Tyre Company advise us that they have now opened their new motor tyre repair works at Hythe Road, Willesden Junction, which they have fitted up with modern machinery and up-to-date equipment necessary for the prompt and efficient repair of motor tyres. They are in a position to execute repairs of all kinds to motor covers and inner tubes within a few days from receipt.

THE Coventry Chain Company. Ltd., advise us that they have a display of their chains for automobiles and commercial vehicles at the Automobile Exhibition in Berlin at Stand No. 102, and their Mr. Norman Hill and Herr Thater will be in attendance.

THE 200-h.p. Darracq, on which Demogeot, on the Ormonde Beach, Florida, covered 2 miles in 58⅘s., was fitted with Dunlop motor tyres.

MR. G. HUBERT WOODS, late manager to Messrs. Cockshoot and Co., Manchester, engineer, has taken up the management of the Simms Manufacturing Company, Ltd., for the engine, motor car, 'bus, van, lorry, and Simms-Bosch magneto departments.

MR. JACOMB-HOOD, the chief engineer of the South-Western Railway, has just purchased a 10-h.p. Rolls-Royce car.

IMMEDIATELY on his arrival at Edinburgh on his non-stop engine run from London, Mr. Charles Jarrott wired to the Continental Tyre Company as follows: "The Continental tyres on my Crossley car behaved splendidly, no trouble of any kind, distance covered, London-Edinburgh, in 20 hrs. 35 min. without stopping engine.—JARROTT."

Sirdar Rubber Co., Ltd. v. Wallington, Weston and Co.

THE appeal of the Sirdar Rubber Company, Ltd., in this action has been dismissed on the ground of the patent being inadequately described by the specification. But the Sirdar Company inform us that they are advised that there is sufficient description in the specification, therefore they are appealing to the House of Lords.

CLIMBING SALISBURY CRAGS, EDINBURGH.—At the summit of the Crags.

COMPANY DOINGS.

Car and General Insurance Corporation, Limited.

THE directors' report, and accounts of this insurance company just issued, show a very satisfactory condition of affairs. The gross premium income amounts to £71,959, and the net premium income to £64,475, as against a net premium income of £26,828 for the previous twelve months. During the year 1,624 new agents, as against 1,443 for last year, have been appointed, making a total of 3,067. Ten district managers or agency superintendents have been appointed to work from Brighton, Bristol, Croydon, Ealing, Hereford, North of London, Norwich, Nottingham, Sheffield, and West End of London, making a total of twenty branches. The whole of this agency and branch organisation has been obtained at a capital outlay of £7,821. The percentage of gross expenses (*i.e.*, before deducting any sum on account of branch or agency organisation) to net premium income has been reduced from 51·4 per cent., for 1904, to 40·4 per cent. for last year. The directors recommend, after writing off the whole of the preliminary expenses, amounting to £1,751 18*s.* 8*d.*, that the balance of £1,409 14*s.* 3*d.* should be carried forward.

Omnibus Company Reports and Motor 'Buses.

IN the directors' reports of the Associated Omnibus Company, Limited, and the London Road Car Company for 1905, issued last week, some matters of interest to the motor world are recorded. The report of the former states that the traffic receipts of the horse omnibuses show a falling off as against the previous year, and maize has been dearer, but the total receipts have been maintained by the addition of the motor omnibus returns and increase of private hire. Owing to the rapid increase of motor omnibuses in London, and in order to keep abreast with the times, the directors decided to augment the working capital of the company by creating £50,000 of 5 per cent. debenture stock. Of this sum, the Board issued in December £25,365, which it is considered will be sufficient for some little time. The Board has entered into contracts for the supply of a large number of motor chassis by Messrs. Milnes-Daimler, Limited, the De Dion Bouton-Company, Straker-Squire, and others, and have eight already at work. A commodious garage has been erected in close proximity to the company's principal routes, fitted with electric light and necessaries for the carrying on of the business. The directors deem it expedient under the circumstances paying only 6 per cent., and writing off a considerable sum from the horse and omnibus stock, thus extinguishing the item under the reserve accounts of horse renewals, £5,335.

The Road Car Company.

EQUALLY significant are the recommendations of the directors of this company, who report that, after allowing for the usual depreciation, they recommend a dividend for the half-year ended 31st December last at 5 per cent. per annum, setting aside £5,000 towards writing off horses, horse cars and harness put out of use through the introduction of motor traction, and the setting aside of £1,000 towards the depreciation and renewal of motors.

* * * *

The "Freak" Car fatal Accident.

AT the inquest held upon the body of William Edward Honnor, who received injuries which proved fatal at the works of the Clement Motor Company, Leicester Street, Leicester Square, the jury returned a verdict of accidental death, expressing the opinion that the Clement Company took all necessary care for the protection of their workmen.

Mr. Edward Henry Lancaster, managing director of the Clement Motor Company, said the car which was the cause of the accident was brought to him to be overhauled. It was a "freak" car—nothing more or less. As none of his men understood it, he sent it to a man at Wimbledon who did, and he delivered it to witness about three weeks ago, finished. It was sent to the second floor to be polished and, in moving it, the steering gear broke. It was then sent to the top floor to be repaired. Deceased was given the order to repair it, but how he started the engine witness could not say.

The Coroner, in summing up, said it was one of those cases which showed that it was a commonsense and prudent rule to lay down in motor works that under no circumstances must an engine be started. The car had been described as a "freak." Certainly it was very different from the ordinary type of motor car, and it could only be conjectured that deceased, curious about the working of the car, unfortunately started it.

LEGAL INTELLIGENCE.

"Motor Schools"—the Alleged Frauds.

AT Westminster Police Court, on Feb. 1st, before Mr. Curtis Bennett, Riski Madawar, 22, a Turkish subject, described as a motor-car dealer, of 47, Victoria Street, Westminster, and John Raymond Kerr, 21, clerk, of Warwick Gardens, West Kensington, fashionably-dressed young men, were again charged with conspiracy to defraud and with obtaining money by false and fraudulent pretences to teach pupils motor car driving.

Mr. Leycester was counsel for the prosecution, and Mr. Charles Mathews, barrister, appeared for the defence.

The vestibule of the court was filled with young men interested as prosecutors or witnesses.

Mr. Leycester said the prosecution was of an important character, the defendants having carried on a bogus business, known by the high-sounding title of "The Motor Drivers' Union." The case against the prisoners was that this concern existed only for the purpose of obtaining money from young men anxious to qualify as motor drivers. The offices were at 47, Victoria Street, S.W. Madawar was represented as the proprietor of the business, and Kerr as the secretary. By extensive advertising, from July last until last month, a very large number of young men had been defrauded of sums ranging from four to fifteen guineas. The advertisement stated that the "Motor Drivers' Union" gave instruction in driving, mechanism of motors, and repairs, that the cars included the latest 1905 types, and that many vacant berths were at the disposal of pupils. Applicants to the prisoners were furnished with pretentious-looking documents setting out that the business was "founded for the welfare of established and prospective chauffeurs," and persons were warned against many advertised schools. The garage was referred to as the best-equipped in London, and a Press notice—from a trade journal—was sent out accompanied by pictures supposed to represent the classes of young men receiving instruction. The notice throughout was written in a highly-eulogistic strain, the garage being referred to as in "the heart of the West-End." As a matter of fact, it had its existence in a disused stable at Coach and Horses Yard, Old Burlington Street, and particular care was taken that none of the pupils saw it until after they had parted with their money. The only instruction ever given with regard to mechanism was a lecture on a motorcycle engine. The farce was gone through of giving what were called driving lessons on the Thames Embankment, the pupils being taken for a brief ride and allowed for a minute or two to hold the steering-wheel, but not to touch the machinery.

Evidence was called in support of counsel's statement.

Mr. Davis, one of the pupils, stated that when he complained of the misrepresentation about the garage, &c., Madawar said if a pupil upset him he would show him something so terrible that he had never seen in England before. Prisoner subsequently told the witness never to let him see his face again. Witness retorted, "Only at the police court."

Mr. Charles Mathews said he had read through the informations and recognised it was a case which the Court would probably send for trial. Under the circumstances he did not propose cross-examining the witnesses at this Court, but it must be understood that the defendants reserved their defence, and that at the proper time it would be shown that there was a perfectly *bona-fide* school of instruction.

The case was further adjourned after other evidence.

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Rolls-Royce Extensions.

THE manufacture of Rolls-Royce cars will, in future, be carried on by a new Company called Rolls-Royce, Limited, the capital of which is £60,000. The principal shareholders are Royce, Limited (who are receiving only debentures and shares), and the Hon. C. S. Rolls, whose firm, C. S. Rolls and Co., are now absolutely devoting themselves to the sale of the Rolls-Royce cars. A considerable quantity of new machinery and additional machine tools have been ordered, by which the output of the factory is being greatly increased. It is understood that the new Company is only a stage in a scheme of considerable proportions.

* * * *

NEW COMPANIES REGISTERED.

Fylde Motor Service Company (Limited), Blackpool and Fleetwood Tramroad Office, Bispham, near Blackpool.—Capital, £20,000 in £1 shares. Object, to acquire the Fleetwood Motor Passenger Carrying Company, Limited. First directors, R. S. Boddington, G. Richardson, R. H. Prestwich, R. B. Barningham, J. Greenwood and J. Cameron.

NEW COMPANIES REGISTERED (*Continued*).

Aries (Limited).—Capital, £1,000 in £1 shares. Object, to carry on the business of manufacturers of and dealers in motors and cycles of all kinds, &c.

Bougie Pognon (Limited).—Capital, £5,000 in £1 shares. Object, to carry on the business of manufacturers of and dealers in motors, motor cars, &c. First directors, M. Hobson, C. Hobson, H. Hobson, and E. A. H. de Poorter (managing director).

Chassis and Coach Supply Company (Limited).—Capital, £5,000 in £1 shares.

Devonshire Motor and Cycle Company (Limited), 192, Brookhill, Sheffield.—Capital, £1,000 in £1 shares. Object, to acquire the business carried on at Sheffield by John T. Walker and Ada Walker. First directors, J. T. Walker and H. W. Webster.

General Motor Development Syndicate (Limited), 7ab, Lower Belgrave Street, S.W.—Capital, £5,000 in £1 shares. Object, to promote motor, cycle, and other companies. First directors, J. J. Mann and G. Oakey.

Headingley Motor and Engineering Company (Limited), 18, St. Michael's Lane, Headingley, Leeds.—Capital, £1,000 in £1 shares. First directors, J. J. Nicholson and J. S. Saville.

Hull City Garage (Limited), 7, North Street, Hull.—Capital, £10,000 in £5 shares. Object, to acquire from A. J. Atkinson, of Elloughton, Yorkshire, the undertaking of the City Garage carried on by him in North Street, Hull. First directors, A. K. Dibb, A. J. Atkinson, G. W. T. Wade, T. M. Newell, A. Reckitt, and E. S. Wade, J.P.

Ilford Accumulators (Limited), 13, Borough High Street, S.E.—Capital, £12,500 in 11,500 preference shares of £1 each, and 20,000 founders' shares of 1*s*. each.

Kennard Motor Company (Limited), 18, City Road, Cardiff.—Capital, £3,000 in £1 shares. Object, to adopt an agreement with W. E. Kennard for the acquisition of the business carried on by him at 18, City Road, Cardiff, of dealers in motor and other cars, &c.

Mercial Tyre Company (Limited).—Capital, £2,000 in £1 shares. Object, to adopt an agreement with J. C. Akerman and J. T. Akerman, for the acquisition of patents for an invention relating to improvements in the manufacture of motor tyres.

Motors (Blackpool) (Limited).—Capital, £3,000 in £1 shares. Object, to carry on the business of motor garage proprietors, dealers in motor cars, &c. First directors, T. Bannister, H. Merrall, J. R. Huddlestone, and R. Woodhead.

Nesbitt and Cunliffe (Limited).—Capital, £5,000 in £1 shares. Object, to acquire and carry on the business of motor, electrical, and general engineers, carried on by E. A. Nesbitt and E. H. Cunliffe, at Myron Place, Belmont Hill, Lewisham, as Nesbitt and Cunliffe.

Pherola Spring Wheel Company (Limited).—Capital, £15,000 in £1 shares (5,000 "A" and 10,000 "B"). First directors, P. J. Neate (chairman), B. R. Wills, K. Ahlquist, R. M. Neate, and A. Wills.

Weigel Motors (Limited).—Capital, £7,500 in £1 shares. Object, to carry on the business of manufacturers of and dealers in motor and horse-drawn carriages, airships, balloons, &c.

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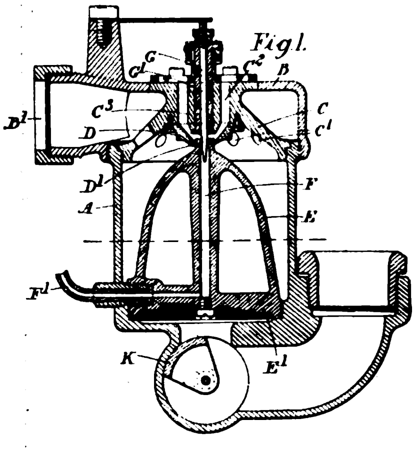
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

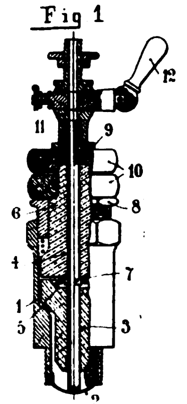
The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

14278. 11th July, 1905. Improvements in or relating to Carburettors for Internal Combustion Engines. Charles Robinson, 60, Park Road, Bromley, and George Mole, the Cottage, South Hill House, Bromley. This invention has for its object to provide a carburettor having a non-suction fuel supply and means by which this fuel supply can be regulated either automatically or by hand for the purpose of controlling the engine. The fuel is fed to the air supply by gravity, and can be controlled so that a constant supply is fed to the mixing-chamber, such supply being in no way affected by the speed of the engine. There are four figures. Fig. 1 is a central vertical section through the carburettor. A casing, A, constitutes the mixing-chamber, and has screwed on to it a cap, B, which closes the upper end of the chamber, and has an air inlet, B¹. The upper end of the casing, A, has an internal thread which receives a conical annulus, C, having perforations, C¹. The upper end of this annulus extends through the cap, B, so that air entering the chamber, A, from the inlet, B¹, has to pass through the perforations, C¹; the central aperture, C², of the annulus is open to the atmosphere. Secured to the underside of the annulus, C is a circular baffle, D, having a central orifice, D¹. Within the mixing-chamber, A, is a conical body, E, secured to the lower end of the mixing-chamber and extending upwardly therefrom, and through the centre of this body is carried a petrol nozzle, F, which extends through the orifice, D¹, in the baffle, D, so that it is in free communication with the atmosphere by way of the aperture, C². The nozzle is fed by a conduit, F¹, communicating with a source of supply situated at a higher level than the nozzle, so that gravity will cause the petrol to flow from the nozzle on to the exterior of the vaporising cone or body, E. Above the nozzle is a valve having a tapered spindle, G. which enters the mouth of the nozzle. The spindle is carried free in a sleeve, G¹, which slides freely in a central boss, C³, with which the annulus, C, is provided. This boss is situated centrally in the aperture, C², and connected to the annulus by suitable webs. The throttle, K, is first opened by turning the rocking shaft, which may be effected by any suitable mechanism operatively connected with the arm. This movement of the rocking shaft raises the sleeve, G¹, so that the spindle, G, is lifted partially from the valve nozzle and petrol escapes. This gravitates down the exterior of the nozzle and over the exterior face of the cone, E The engine is now started, and sucks air through the inlet, B¹, into the chamber, A. The air enters the chamber through the orifices, C¹, in the annulus, C, which serves to disperse the incoming air, so that it enters the chamber on all sides instead of on that side only which is nearest to the inlet. The air passes through the chamber, A, to the throttle valve, K, and in doing so becomes carburetted by its contact with the petrol exposed on the surface of the cone, E. The cone, E, is carried by four webs, E¹, which are screw-threaded to engage a corresponding screw-thread on the interior of the chamber, A, but an annular space is left between the cone and the wa of the chamber.—January 17th, 1906.



18832. 18th September, 1905. Improvements in or relating to Sparking Plugs for Internal Combustion Engines. Alfred J. Boult. A communication from Léon Macquaire, 21, Rue de Malte, Paris. This new plug is arranged in such manner that by means of a hollow electrode and a blow-off valve or cock arranged to control the passage through this electrode it is possible to clean it in a perfect manner at any moment, and without taking it to pieces, so that it and at the same time the cylinder of the engine may be readily cleaned, and whereby compression valves or cocks as at present used can be done away with. There are two figures. Fig. 1 is an elevation of the plug partly in section. The main body, 1, of the plug terminates at the bottom in a cap, 2, either made in one piece with it or secured to it, cut out in the centre in the shape of a cross or star, so that a variable number of points can be obtained for producing sparks. In the body, 1, is placed the porcelain part, 3, perforated for the passage of the hollow electrode, 4, a recess being provided in its upper portion for receiving the nipple, 5, terminating the bottom of the second porcelain part, 6. An asbestos joint is arranged between the body, 1, and the porcelain part, 3. The second porcelain part, 6, is arranged direct on the part, 3, the shoulder, 7, of the electrode, 4, engaging with the recess in the nipple, 5. A nut, 8, surrounding the porcelain part is screwed into the interior of the main body, 1, pressing by means of the shoulder at the bottom part of the porcelain, 6, and of the bottom reduced portion of the main body, 1, the two porcelain parts one against the other. An asbestos joint could also be placed between the base of the nut and the shoulder of the porcelain, 6. The tube, 4, or central electrode terminates at the top in a screw-threaded portion intended to receive a sleeve or nut, 9, which ensures its stability during erection owing to the pressure which it exercises on the shoulder, 7, arranged in the recess of the nipple, 5, of the porcelain part, 6. Its bottom portion is simply split, say, into four in the example illustrated, in order to obtain four points corresponding to the four branches of the cross-shaped cut out in the cap, 2. The production of sparks will, therefore, take place between the points formed by the lines of slots of the tube and the points of the star or cross, this multiplication of the points of sparking ensures good working, and this division of the end of the tube enables, when the valve is opened and the gases escape, the cleaning of that part of the plug to be effected in a thorough manner inside and outside. Round the nut, 9, and the upper portion of the porcelain part, 6, which is slightly reduced at that point, are arranged two fibre washers, 10, which prevent air from coming in contact with the porcelain, and give protection against shocks, and ensure perfectly tight joint of the whole. They are pressed against the upper non-reduced portion of the porcelain part, 6, by screwing down the valve, 11, on the nut, 9. The plug of the valve or cock, 11, is perforated, and terminates in a handle, 12, made of fibre or some other insulating material.—January 17th, 1906.

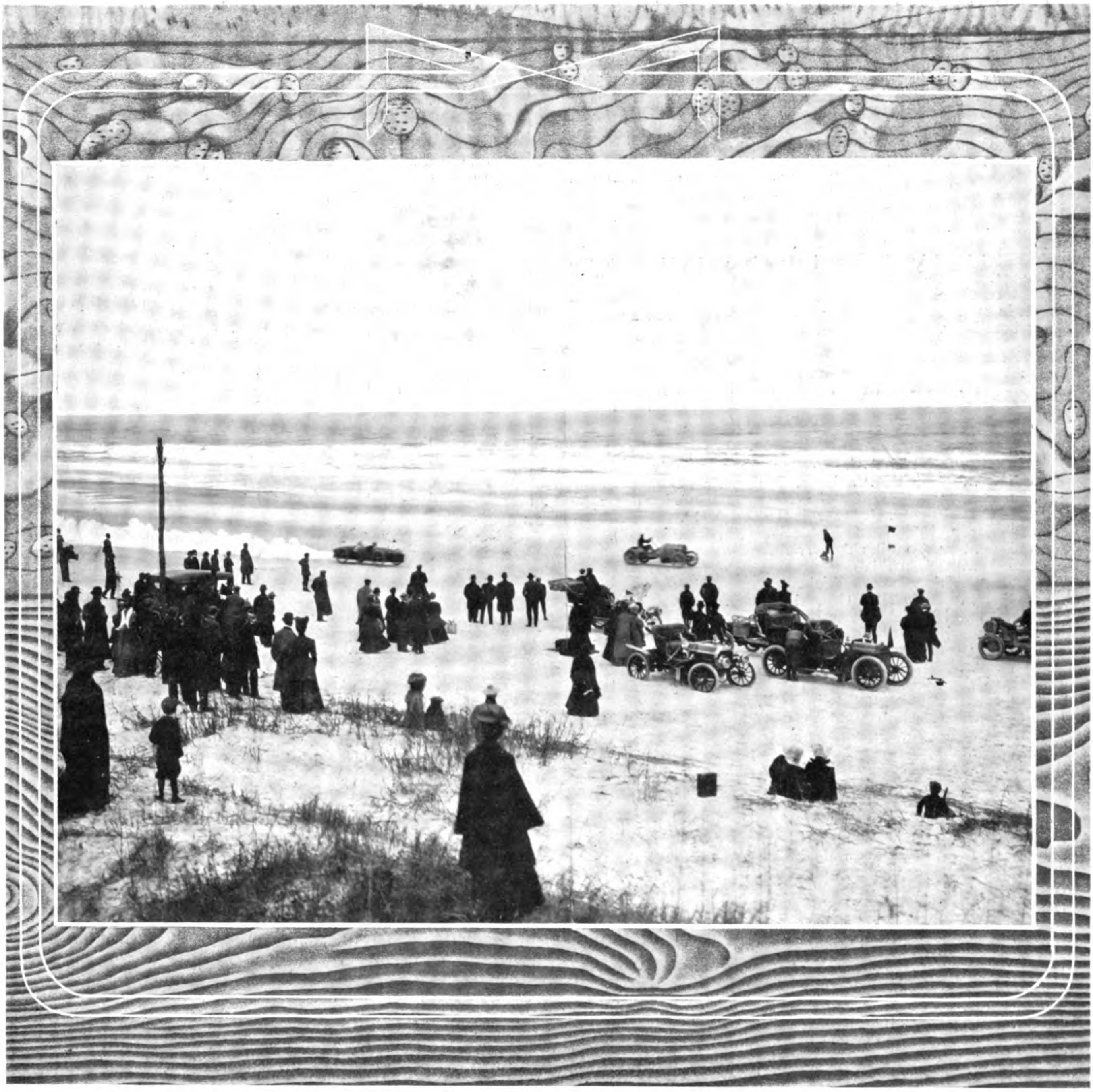
Fig 1



The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

No 267. (No. 7, Vol. XI.)] FEBRUARY 17TH, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.



ORMONDE-DAYTONA BEACH RACES.—General view at the finishing point. The race being concluded is for the Dewar Challenge Cup (1 mile), which was secured by the Stanley Steam Car in 33 seconds—the same car covering the same distance during the meeting in the extraordinary record time of 28⅕ seconds, equal to a speed of 127·65 miles per hour. A full account of the meeting appeared in the "Automotor Journal" for February 3rd.

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DIARY OF FORTHCOMING EVENTS.

British Events.

Feb. 19 ...	Scottish A.C. (Western) Annual Dinner.
Feb. 22 ...	Ladies' A.C. General Meeting.
Feb. 22 ...	"A Try for the Herkomer Cup." Paper by Mrs. G. Manville (Ladies' A.C.).
Feb. 23–Mar. 3.	†Manchester Motor Show (St. James's Hall).
Feb. 26 ...	*4,000 Miles Tyre Trials.
Feb. 26 ...	*Lamp Trials.
Feb. 26 ...	*Speedometer Trials.
March 8 ...	A.C.G.B.I. General Meeting.
March 2–10 ..	†Sheffield Motor Show.
March 9–17...	†Glasgow Motor Car Show.
March 24–31	Cordingley and Co.'s Motor Show.
May 26 ...	Motor Union Meeting (Birmingham).
June 11–16 ...	Lands End to John O'Groat's (Auto Cycle Club).
June 13–16 ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July 21 ...	Motor Union Meeting (Bath).
Aug. ...	*Van Trials.
Sept. 22 ...	Motor Union Meeting (York).
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

Feb. 19–25 ...	Paris Voiturettes and Tri-car Trial (*Les Sports*).
March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
April 1–17 ...	Budapest Exhibition (A.C. of Hungary).
April–May ...	Milan Exhibition.
April ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 13–14 ...	Tour de France (Motor Cycles and Voiturettes).
June 6–13 ...	Herkomer Cup.
June 28–29 ...	Kiel Motor Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15–16 ...	Mont Ventoux Hill-Climb.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

"The Automotor Journal" Buyer's Guide.

The motor car industry is in such a flourishing and expanding condition, and the manufacture of automobiles has become so important and profitable a business, that the types and numbers of useful and serviceable cars, which but a few years ago could be numbered on the fingers, now run into a good many hundreds. The perplexity of the intending purchaser who, having been converted to the advantages and charms of the new locomotion, has decided on becoming the owner of a car, have accordingly increased by leaps and bounds also, and it has become a very difficult undertaking for him to form an idea, in the first place, of the sort of vehicle he wishes to purchase, and in the second place, of how far, when he has decided that point, anything corresponding to it at present on the market comes within the limits of expenditure which he is willing and able to incur. Anything that renders it easier for him to settle what he really requires and come rapidly to a decision, should prove a comfort to him. With a view to simplyfying matters, therefore, and enabling prospective customers to see at a glance the characteristics of the principal cars on the market, what they can accomplish, the price that is asked for them, and the main details of their consruction, *i.e.*, the type of engine, gear, number of speeds with which they are fitted, kind of ignition employed, the type of clutch adopted, and all the other features which may be of importance in a car, we have arranged, collated, and classified in tabular form all the necessary information of this character. This "buyers' guide" is arranged in very much the same way as that which we published at the time of the last Olympia Show, but it contains practically every known make of car which is at present on the English market, whereas our earlier tables referred only to cars on view at the Show. As before, those items, which every intending purchaser must primarily take into consideration, are grouped together under a separate sub-heading in the first few columns, and the following columns give further particulars, mainly of an engineering kind, which most purchasers wish to know before finally deciding on any particular car. But in this new "guide" we have been able to go much further than before, and on the extreme right of each page will be found the country of origin of each car, *i.e.*, whether it is British-made, or manufactured in some other country—information which we are, we believe, the first ever to have collected and published—and references to the volume and pages of The Automotor Journal, in which full descriptions of each of the cars have already appeared.

◆ ◆ ◆

To Facilitate Selection.

These tables therefore will provide the motoring public with a birdseye view of the whole automobile industry. The moment he has formed even a hazy general conception of the kind of car that he requires, even if he has decided on nothing further than the number of people it is to carry, the speed at which it is to go, and what it is to cost, he can look down the table and find a certain number of cars that more or less conform to these requirements. Then when he has selected, say, a dozen or more cars that in these respects may possibly suit him, he will, if he has any special preference for any particular type of engine, gear, drive, or other characteristic, be able to reduce his list still further, and if he is still desirous of information to assist him in forming his final selection, he can, in the majority of cases, obtain it by referring to the back numbers of The Automotor Journal, in which we have described the car or cars which form, say, his final selection.

It is not only, however, to the prospective purchaser that our "Buyer's Guide" is calculated to prove of assistance, for everyone interested in the statistics of the motor car industry will have a great portion of the information they are likely to require tabulated for them and ready in its most concentrated form.

It is our hope that the tables may be found thoroughly useful, in fact, to everybody connected with the automobile movement, for their compilation has involved the expenditure of a very considerable amount of time and trouble in the collection and arrangement of the data which we now publish. We have received the most cordial co-operation and assistance from all the leading manufacturers and agents in the kingdom. We are accordingly able to affirm, without fear of contradiction, that the "Guide" is as complete and comprehensive as it is possible for any table of the kind to be.

◆ ◆ ◆

Our Table Analysed—A Testimonial to the British Industry.

Incidentally, the figures and statistics which we have collected for the assistance of the prospective purchaser, provide a very fine testimonial to the growth and the increasing importance of the British trade. Out of the 498 cars which appear in our "guide," some 203 (approximately 40 per cent.) are entirely of British manufacture; 185 (37 per cent.) are French; some 18 (3·6 per cent.) American; 16 (3·2 per cent.) Belgian; and only 14 (2·8 per cent.) German, the remainder being made up of 9 Italian, 4 Dutch, and 3 Swiss vehicles. There remain some 41 composite cars, that is, cars of which the engine is manufactured in one country and the chassis built in another. Of these, 20 have British-built chassis fitted with French engines; 12 have French chassis fitted with British engines; and 9 have Belgian chassis, this country providing the motive power. Certainly two years ago, had we compiled similar statistics, the manufacturers of this country would not have been able to account for anything like 40 per cent. of the cars actually on the market.

◆ ◆ ◆

No More Unofficial Trials.

The Automobile Club has decided to put its foot down in regard to all unofficial car tests, trials and endurance runs of the kind that have from time to time been held under other than club auspices. We publish elsewhere the official notification to this effect, and we think the club is taking a wise course in the line it is adopting. It has established special machinery for enabling anyone who desires to do so, to have an official run with his car for as great a distance as he likes, and under exacting conditions, in regard to the *bona fides* of which no possibility of doubt can arise, since the trial is conducted under the observation of Club Observers all the time. The club, which is the leading "Society of Encouragement" in the country, is naturally the guardian of all records of what cars can do under test conditions, and it is wise in determining not to allow its authority to be usurped by any irresponsible individuals, however trustworthy and independent, who choose to get up a trial on their own account. Only official management and recognition by a body like the Automobile Club can prevent trials of this kind from degenerating into a farce, and if they are permitted *ad libitum*, farcical they are bound to become, sooner or later.

This is the same line of argument that we adopted, it will be remembered, in reference to the question discussed a considerable time ago as to whether private individuals, newspapers, and the like, should or should not hold reliability trials without the supervision and sanction of the club. The method by which the club prevented that being done, is now being adopted in the case of shorter trials. It proposes to disqualify any car owners or manufacturers who take part in them from all official trials or events held by the club. And this penalisation will, no doubt, prove effective in preventing the further spread of enterprises of the kind.

◆ ◆ ◆

A Little Less Expenditure Advisable. As the club is now taking over and assuming for itself a definite monopoly in the management and recognition of all trials of motor cars, we are glad to see that they are also taking into consideration the fact that this monopoly involves obligations. The existing tariff of charges for conducting an official trial are decidedly high. They do not mean much, of course, to the great manufacturers, but then, on the other hand, it is not the great manufacturers that are most in need of trials. It is the small, or at any rate, the newer firms that are most likely to desire them; and to many such, the present charges and fees are simply prohibitive. The club is, we thoroughly admit, wise in insisting upon a monopoly of car trials, and we are convinced that it is to the benefit of the industry that they should do so, but at the same time, under the circumstances, they must diminish the cost involved. Certainly, as a "Society of Encouragement," the club should not count upon making any profit out of them—rather the reverse, if necessary.

◆ ◆ ◆

An Ancient Horseless Carriage. A good deal of attention has very naturally been attracted by the instructive experiments that are being carried on at Aldershot by the Engineering and Aeronautical Section of the Engineers with Mr. Cody's man lifting kites, and it is therefore particularly appropriate to call to mind that what the kite can effect as a means of traction was fully recognised and actually employed in practice with very considerable success in the days when the old steam cars were first fulfilling the prophecy of Mother Shipton about carriages running without horses. Mr. Cody, it will be remembered, gave a demonstration of the tractive force of well-constructed kites a little more than a year ago, when he navigated a boat across the Channel, the motive power of which was supplied in this way. But much longer ago than this—about 1840 in fact—a light car propelled, or perhaps we should say drawn, by a team of kites, made a splendid run along the Bath Road. The machine was controlled by a powerful ground-brake, which brought it to rest when required, the kites, under those circumstances merely rising higher overhead and perhaps diving about a little eccentrically. The car itself was steered by a bicycle type of handle-bar, acting on a turn-table, and somewhat resembled a modern runabout type of motor car. In another column we produce an account of the very interesting experiments to which we refer, with illustrations depicting the kite-drawn car at full speed on the Bath Road, in fact, passing a coach-and-four, to the great fury of the driver of the latter, the admirers of the horse having in those days been even more hostile to mechanical locomotion, in any form whatever, than they have been latterly. The article we reproduce furnishes an interesting and instructive glimpse of the past, and affords a clear idea of the initiative, ingenuity, and comprehension of mechanical principles which characterised that very remarkable period, when those wonders of ingenuity, the old steam cars, had their birth, and when Faraday was first making his immortal pioneer experiments on the nature of electricity.

◆ ◆ ◆

The Training of Motor Drivers. The Motor Union continues to do good service in working for a more satisfactory state of affairs in regard to the training of motor car drivers. There have been some nice disclosures lately in the Press. The daily papers have borne witness to the existence of a number of institutions which are perpetually engaged in perpetrating one of the most cruel forms of the confidence trick—taking money from people who want to earn their own living and require badly to do so, and teaching them nothing in return. The fraudulent motor-driving school, in fact, is a cruel fraud on an aspiring class of the community, and is a detestable nuisance to the owners of motor cars, as well as instrumental in putting, we may say, into circulation—at any rate turning out into the world—a number of drivers provided usually with some sort of certificate, and more or less believing themselves to be competent, who would at once be sources of serious trouble to any establishment where they were regularly employed to drive and manage cars. The course which the Motor Union is adopting in order to grapple with the present situation is to arrange, if possible, for the establishment of *bona fide* institutions, where motor driving and motor car management will be properly taught, and with this object in view, the Secretary has addressed communications to the Town Clerks of Manchester, Birmingham, Southampton, Bradford, Liverpool and Cardiff, and also to the London County Council, inquiring whether these local bodies have taken any steps to provide facilities "for the training of mechanic drivers for motor cars, or to contribute to the cost of voluntary establishments having this object in view." The replies the Secretary has received up to the present show that a special class for motor car engineering has been established in Liverpool, though it is not designed to train drivers, but the authorities there are willing to consider any suggestions which the Motor Union has to make. The Clerk of the London County Council has explained, in reply, that the Education Committee of the Council consider that the best way in which such instruction should be afforded would be by the various polytechnics and similar institutions of the Metropolis, and they, too, are willing to adopt any suggestions the Motor Union may put forward.

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Royal Commission on Motor Cars.

THE Commission continued their sittings last week, and the following witnesses were examined:—Mr. John Drysdale and Mr. H. Hope, representing the Scottish Chamber of Agriculture; Mr. W. Henderson, representing the Perth County Council; Mr. J. Marr, representing the Highland and Agricultural Society; Mr. John Speir, representing the Glasgow Agricultural Society; Sir George Murray, Permanent Secretary to the Treasury; and Sir Henry Primrose, Chairman to the Board of Inland Revenue.

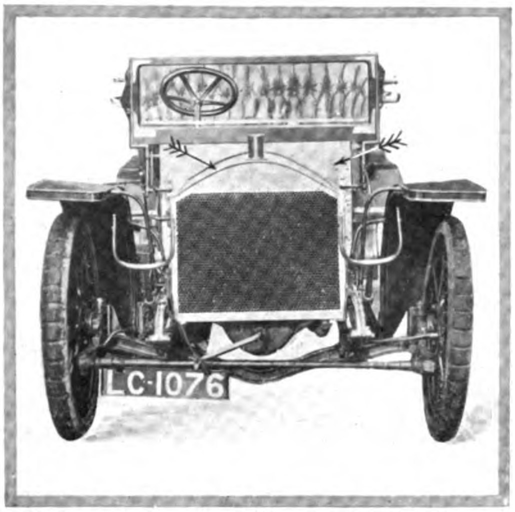
How to Recognise the Cars of To-day.

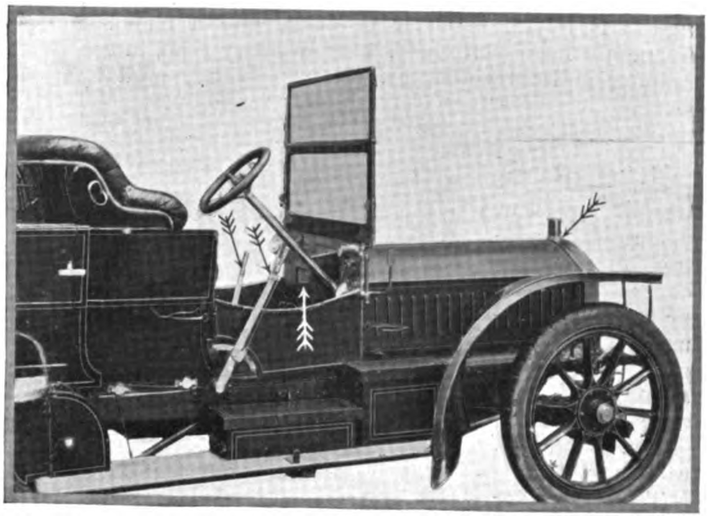
(No. 3).

The 6-cyl. Napier.

(BRITISH)

40 H.P. & 60 H.P.





The latest 40 h.p. and 60 h.p. Napier Cars—built in London—are live axle vehicles, but the earlier 40 h.p. model, which is still a standard type, is chain driven. Distinctive features are the comparatively narrow RADIATOR, with its numerous hexagonal tubes and tall filler-cap, the solid ALUMINIUM DASHBOARD, fitted centrally with its glass-fronted ignition box, and the plate-glass wind-shield with which these cars are usually provided. The CHANGE-SPEED and BRAKE LEVERS are also unlike those on other cars. (See "Automotor," Vol. XI., Jan. 13th to 27th, 1906).

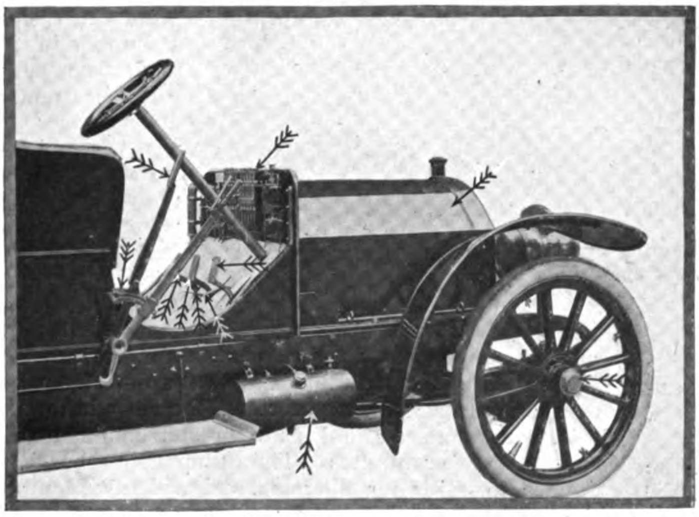
* * *

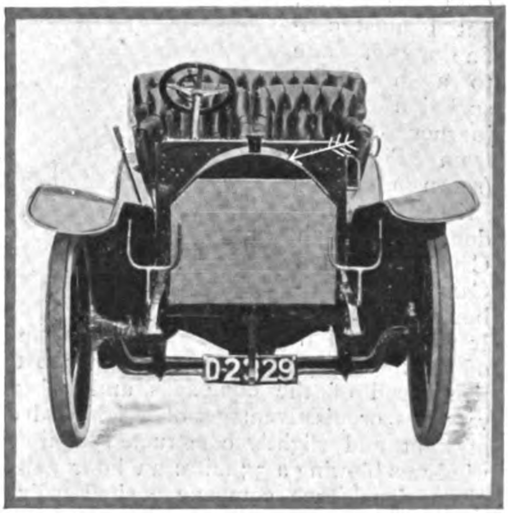
(No. 4).

The Mercedes.

(GERMAN)

20-25, 35, 45, & 70 H.P.





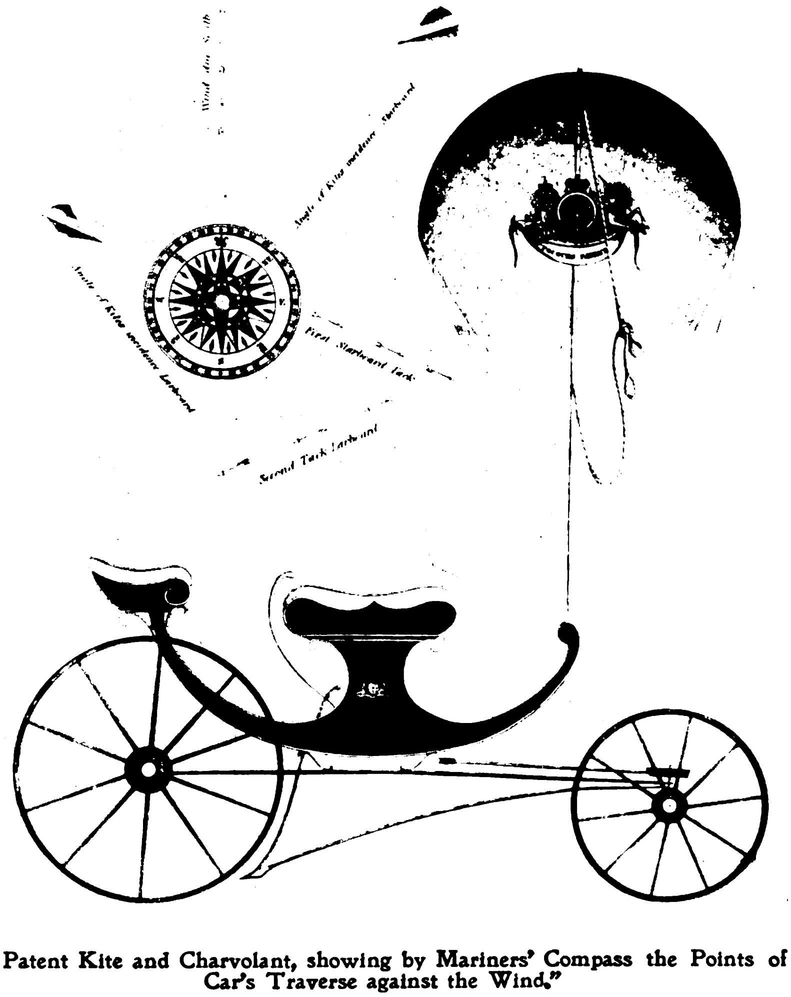
These German "Daimlers," which are entirely unlike the British Daimlers, are more easily recognised by their GENERAL APPEARANCE than by any particular detail, since many of their leading features have been copied on some other vehicles. Special characteristics are, however, the shape of the BONNET, the multiple-feed LUBRICATOR on the dash, the external PRESSURE TANKS fixed at each side of the frame, the GEAR LEVER, and the THREE LARGE PEDALS, as well as one or two small pedals. Usually the upholstery is in bright red leather, and invariably the "Daimler" name appears on the compact axle-caps. (See "Automotor," Vol. X., Sept. 30th and Oct. 7th, 1905).

TWENTY-FIVE MILES AN HOUR.

A Bath Road Record of Sixty Years Ago.

HAVING regard to the meagre speed limit for motors allowed by the Legislature, it comes as somewhat of a surprise to learn that nearly sixty years ago wild, untamed horseless carriages ran the highways at rates varying from 20 to 25 miles an hour. Mile after mile in succession, says the author of the little work beside me* has been performed at the rate of 20 miles an hour, timing it by chronometer in hand, and a mile has frequently been performed, over a heavy road, in two minutes and three-quarters. It may be supposed by some, he continues, that this celerity is dangerous — that it would prevent respiration, adding that it is certain the swiftness of the movement should almost prevent breathing if one were going against, instead of with the wind.

These wonderful journeys were performed in a "charvolant," or kite carriage, a lightly-built equipage to which are harnessed two kites, known as draught and pilot sail respectively. The book teems with marvels performed (or to be performed some day) by the kite, but I must confine myself here to a brief description of a journey made from Fig Hill (seven miles from Bristol) to London, through Chippenham, Calne, and Marlborough Downs. It was a trial trip, undertaken by three charvolants of varying size and draught power, "to test the relative speed of the equipages and to mark the advantages or disadvantages of weight and compactness, of light and slightly constructed equipments." The wind was blowing a 35 miles an hour gale, and at the given signal each company dashed gaily forward, the buoyant sails were unfurled, the canvas raised to the wind, and they were under way. We are in the heaviest car, with a pilot sail of 12 ft. and a draught sail of 20 ft., and up the steep ascent of Fig Hill we make the pace for the others; but, a downward incline reached, the lighter cars shoot ahead "with tremendous velocity." At the village of Ford, eight miles from the starting point, "we cast a rapid glance at our chronometer, and find our pace has been, up and down hill, at the rate of 25 miles per hour." The vane of the tall spire in Chippenham having been cleverly "manœuvred," the six miles to Calne is quickly covered, and "clearing every obstacle, we soon find ourselves on the edge of the High Chevil Downs, near Marlborough, our competitors advancing rapidly, but evidently two or three miles in the rear.


Wind due South
Angle of Kites windward Starboard
Angle of Kites windward Larboard
First Starboard Tack
Second Tack Larboard

"Patent Kite and Charvolant, showing by Mariners' Compass the Points of Car's Traverse against the Wind."

"About four miles from the edge of Chevil Downs" (the incident is worth recording *in extenso*) "we encountered a most unwelcome obstacle in a post-chaise and pair, which, though prime cattle, were a lumber in the road, compared with the tremendous pace we were then going— certainly not less than five-and-twenty miles an hour. The post-boy, however, determined to jockey us; he now traversed to the right, now to the left, of the road, just as he perceived we were about to pass him. We were thus effectually blockaded, at a time, too, when, to our great vexation, we perceived the party in the rear gaining upon us so rapidly as to threaten coming up with us in a very few minutes. The occupant of the chaise seemed to enjoy our dilemma, and evidently prompted the postilion in his clever manœuvres. At length, watching an opportunity, no sooner did a spot present itself where the downs sloped smoothly into the road, than the steersman dashed boldly out upon the turf, and, accompanied by the sound of the bugle, in one second our carriage shot ahead, and left our disappointed jockey in the rear. It may be mentioned here that since the withdrawal of the public conveyances from the turnpike roads a greater facility is afforded for the delightful recreation attending excursions in the charvolant, for miles may now be passed on many of our high roads without meeting a vehicle of any description, consequently scarcely any interruption occurs in this respect; indeed, in many places the grass is growing very luxuriantly, and the animals which formerly sweated and foamed whilst traversing these now old-fashioned courses might obtain a plentiful repast on the very ground which they were continually tearing up in their passage through the country.

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* "The History of the Charvolant, or Kite Carriage," with illustrations, by David Cox, Jr. London: Longman, Brown, and Co., Paternoster Row, 1851.

"Night brought a dead calm, with not a breath moving amongst the leaves, but a steady and active breeze was flowing aloft, and a pace of about 18 miles an hour was maintained, the rapid movement demanding a vigilant lookout. The bugle was in frequent requisition and of essential service. After a delightful run we determined to close our day's adventures by bivouacking out till the dawn, in lieu of running into London. We accordingly furled our buoyant sails, reeled the cordage, and repaired to a stack of fragrant clover-hay, still in process of making. There, with our kites once more spread for an awning, and their oval ballast tails for a nightcap, we slept peacefully till awakened by the gay carol of the early lark." Thus abruptly ends the record of the trip.

"There the steersman boldly dashed out upon the turf."

It happened on several occasions, in the course of the writer's excursions, that they pulled up at a roadside public-house in the dusk of the evening, when the kites were hidden from view. Hearing the sound of wheels the ostler very naturally rushes out, probably from the lighted tap-room, to attend to his duties, and approaches, as he supposes, the head of our horse, but finds no trace of that moving power; his bewilderment is most laughable, and he hardly regards our order for some of the best Wiltshire beer. He scratches his head, but does not appear at all satisfied with his calculations as to our mode of travelling. After giving rather a doubtful glance at the occupants of our carriage he proceeds for the beer, and addresses the landlord with "Measter, a quart of beer for summat at the dooer." He appears again, and having recovered his first surprise, awaits with a credulous smile to see how we are going to move off. The beer being paid for, the drag is uplifted, the power line of the draught kite braced up, and dash goes the carriage, leaving the poor man to form his own opinion on the matter, which, we understood afterwards, resulted in the exclamation, "That if he had never zeed the devil afore he zeed un thic night, however."

I feel this article would not be complete without some description of the peculiarities in the construction of the charvolant, as set forth by the writer of the book. I use his words:—First. Before the charioteer is an upright spindle, surmounted by a T handle; the lower part of this handle, which runs through the bed of this car, is square, fitting into the socket of a small, solid, horizontal wheel, round which a strap passing communicates with another horizontal wheel, fastened to the pivot of the front axle-tree. By this apparatus, termed the "guide," the chariot is directed with the nicest precision. Second.—There is a regulator or drag in the hinder part of the car, suspended by a spring. The shoe of this drag is pressed by a lever power upon the ground, by which too great a velocity is prevented, or the vehicle instantly stopped, if requisite; this is effected without alighting. There are several minor appendages not common to other carriages, as a rule, and places for the chronometer, mariner's compass, &c. This car, having movable shafts, may be used with horses, precisely the same as other carriages.

That the vehicle could be stopped without alighting is certainly calculated to give the travellers confidence, but it is difficult to imagine how it would have been possible for the charioteer to dismount and stop the conveyance when it was running at the rate of about 25 miles an hour.

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A Horse Ambulance.

Most people will have noticed the gallant effort being made to inculcate sympathy and affection for the horse, who is now being rapidly deserted by his former friends, made by the Society for Promoting Kindness to Dumb Animals. They have put upon the streets of the Metropolis an ambulance for horses, for conveying the unfortunate victims, that is to say, from the spot where they were injured, to a place where they can either be cured or put out of their misery. It is a nice substantial loose box, plentifully supplied with straw. We would suggest, however, that the proper motive power, under the circumstances, should be automobile. The automobile has shown itself in so many ways the true friend of the horse, that it is quite reversing the natural order of events to have the horse ambulance drawn by other horses. This is particularly the case, as rapidity in transport is sometimes of the greatest importance, and the superiority of the motor where human ambulances are concerned has been universally recognised.

THE NEW "XENIA" CARBURETTOR.

DURING the last two years the Xenia carburettor, which we described (on February 13th, 1904), in connection with the Crossley engines, has undergone considerable alteration. Then, it will be remembered, the principal feature was the automatic auxiliary-air-valve and its method of operation by the variation in level produced by the suction of the engine on a column of mercury.

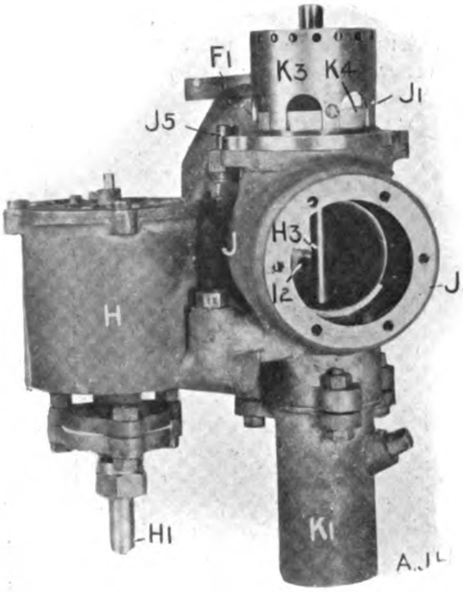

Fig. 1.—The Xenia Carburettor. View of the 1906 model, showing the automatic main air valve, K^4, which is interconnected with a variable petrol jet, and is controlled by the suction of the engine acting against the supporting effect of a float partly submerged in the mercury pot, K^1.

The whole principle has now been materially altered, although the use of mercury still remains as one of its characteristic features. This, however, is now merely employed for the purpose of providing a suitable liquid for supporting the float which controls—but no longer operates—the air-valve; the mercury device therefore constitutes a dash-pot pure and simple. Where the most important alterations have taken place is in the abolition of a fixed main-air port, and in the inter-connection of the variable air-valve—through which all the air now has to pass—with a variable petrol jet. This introduces an entirely new set of conditions, which resemble those governing the Bradley carburettor, although the details in the mechanical construction of the two devices are very different.

When running light, the throttle valve on the new carburettor is shut but the engine is able to draw the necessary supply of mixture to keep running through a small hole drilled in the valve itself. As the throttle-valve is opened, and the suction in the mixing-chamber increases, the main-air-valve is automatically drawn open and the effective size of the petrol jet enlarged. Whilst the air-valve is opening, however, it depresses the float in the mercury until the upward pressure just balances the suction of the engine.

One result of the modifications has been to considerably simplify the construction of the carburettor—as our illustrations very clearly show. For the convenience of our readers, the various corresponding parts are indicated by the same letters as were used in our previous description; consequently the two models can be the more easily compared by those who may desire to do so. In Fig. 1 the carburettor is shown complete, except that the plate which normally covers the large opening, J^2, has been temporarily removed in order to show the position of the jet in the mixing-chamber, and the "no load" hole, I^2, in the throttle-valve. Both the variable-air-valve, K^4, and the mercury dash-pot, K^1, are shown separately in Fig. 2, which also gives another view of the main body of the apparatus, after these members have been removed.

Petrol flows from the float-feed-chamber, H, into the mercury pot, K^1, and by covering the surface of the mercury prevents it from oxidising—a function which was performed previously by a layer of glycerine. From this chamber it ascends inside the hollow jet-spindle, H^2, to its normal level. There are several jet orifices formed by a series of fine holes, in each side of the hollow spindle, H^2, but for light loads the majority of these are covered by a tube, H^3, which surrounds the whole length of the jet-spindle. Cut in the tube, H^3, are two short slots, and it is only when the jet-holes come opposite to these slots that they are rendered operative. Directly beneath the jet-spindle, and supporting it, is the float, K^6, in the mercury pot, K^1. Resting on the top of the spindle is the air-valve, K^4, which is free to move vertically in its cage, K^3. Increased suction in the mixing-chamber—which is in more or less free communication with the induction-pipe, according to the position of the throttle-valve, I—tends to open the valve, K^4, thus admitting more

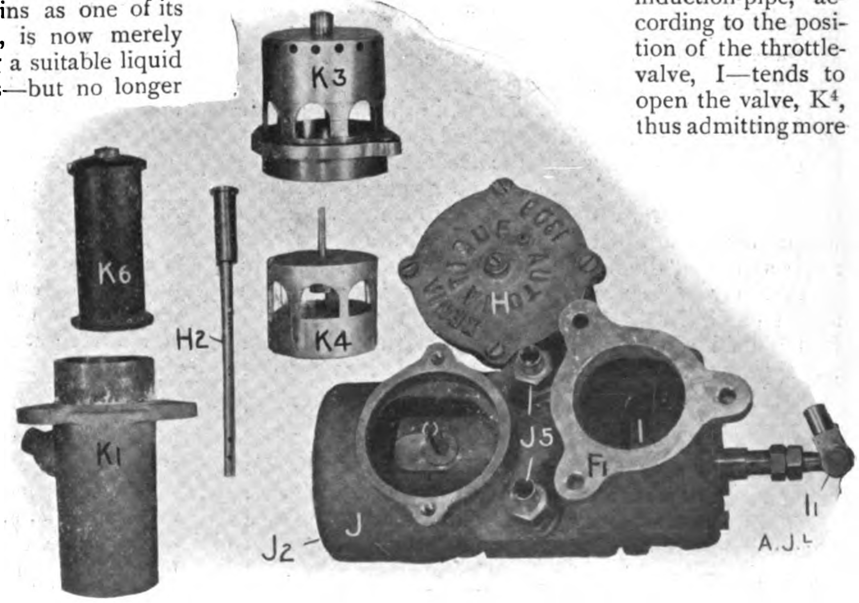

Fig. 2.—The Xenia Carburettor. View showing some of the more important parts of the carburettor separately. On the left is the mercury pot, K^1, with its float, K^6, and between these and the automatic valve, K^4, with its cage, K^3, is the variable petrol jet, H^2, which itself rests on the float and supports the valve.

air, and also tends to enlarge the effective jet orifice, thus correspondingly increasing the flow of petrol, so that a larger volume of correctly-proportioned " mixture " passes to the induction-pipe.

When necessary, the mixing-chamber can be warmed by coupling up its water-jacket to the circulating pump, unions, J^5, being provided for this purpose. It is also a simple matter to adjust the normal level of the mercury after removing the small plug fitted in the wall of the chamber, K^1.

Table of Reference Letters for the Xenia Carburettor.

F^1	Induction-pipe fitting.	J	Mixing-chamber.
H	Float chamber.	J^1	Main-air inlet.
H^1	Petrol connection.	J^2	Plate-covered end of J
H^2	Jet.	J^5	Water-pipe connections.
H^3	Needle-valve.	K^1	Mercury pot.
I	Throttle-valve sleeve.	K^3	Cover for K^4.
I^1	Throttle-valve rod.	K^4	Automatic valve.
I^2	Permanent hole in I.	K^6	Float.

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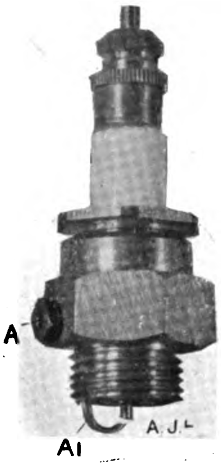
THE "E.C." IGNITION PLUG.

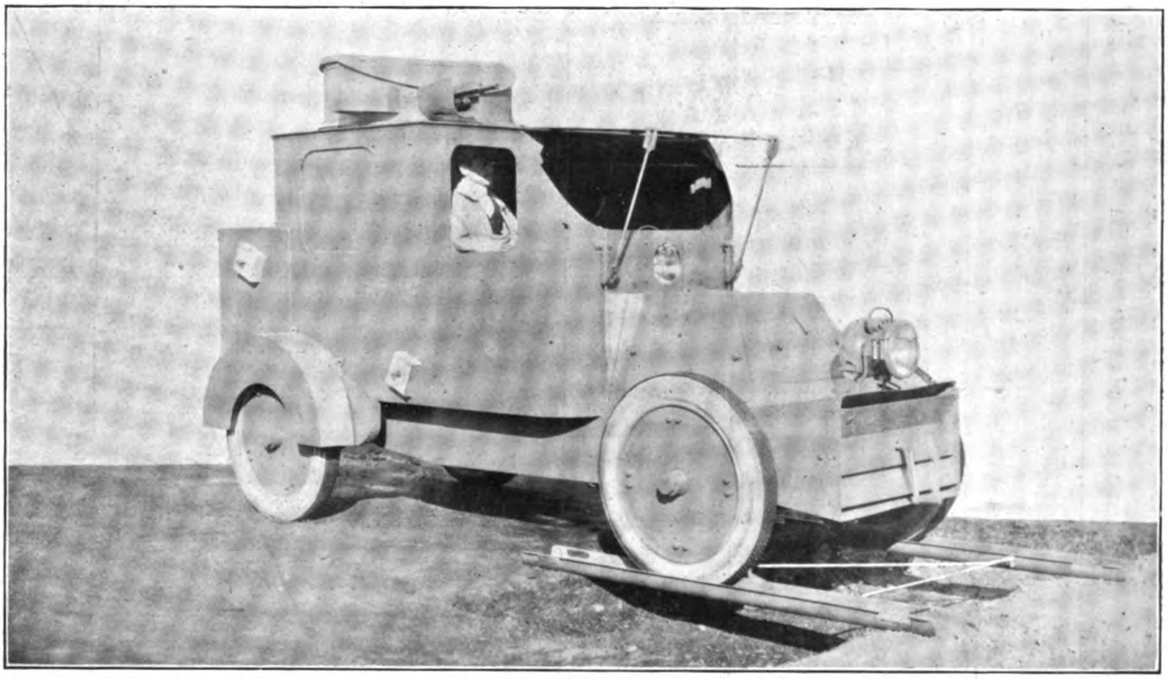


Inventors of ignition plugs are always careful to introduce some arrangement for the especial purpose of preventing permanent deposit on the sparking terminals, but usually this is confined to some characteristic in the general design which permits the gases in the cylinder to exercise a scouring action. In the " E.C." ignition plug, however, this automatic cleansing action is derived from a current of fresh air admitted to one of the hollow sparking terminals.

The orifice, A, through which the air is admitted, is visible in our illustration; it communicates with a narrow pipe, A^1, forming one of the sparking terminals, and it is provided with a small valve, which is intended to prevent loss of compression in the engine. This valve is merely a simple steel rod with a head on one end, and as there is no spring of any description it opens and closes atmospherically.

Motor Tower Wagon for Halifax Tramways.

The Halifax Tramways Committee have invited tenders for a motor tower wagon, to facilitate the work of attending to the overhead equipment of the tramways. New regulations introduced by the Board of Trade require that the installation shall be tested every six weeks. This, having regard to the extent of the system, would be impossible with the present horse tower wagon. The new wagon, which will involve less expense in upkeep than a horse-driven vehicle, is to be from 30–35-h.p. and is estimated to cost about £700.



Quite a number of Armoured Cars are now on order in France for the Russian Government, the first of these curious-looking machines being that shown in the above illustration. They are being built by the well-known C.G.V. firm, and the chassis employed for the purpose differs but little from that of their standard 30-h.p. touring model. Every part above the axles is completely encased in steel, the wheels themselves are built of steel, and provision is made by which the steel side windows as well as that in front of the driver's seat can be closed from within at short notice. Pneumatic tyres are employed, but these are said to contain a solution of some special kind to prevent rapid deflation, even if they should be pierced by a bullet, while spare tyres, fitted to spare wheels are carried in readiness for speedy replacement. Mounted on the roof is a quick-firing gun that can be pointed in any direction by one of the operators inside the car, and provision is made for carrying a large supply of ammunition, in addition to the five passengers. Loaded, and in full running order, the total weight of the car is about 3,000 kilogs., and it is geared to run at some 24 miles per hour on the level. The steel rails seen in the photograph are for enabling the car to cross ditches or to climb up low banks; usually, they are attached to the sides of the "body" by means of the fastenings designed for the purpose.

The AUTOMOTOR JOURNAL BUYERS' GUIDE TO THE TOURING AND PLEASURE CARS (PETROL AND STEAM) OF 1906, CLASSIFIED BY NUMBER OF CYLINDERS AND PRICE. (Copyright Registered.)

NOTE.—In certain cases the information available is so meagre that we have not felt justified in including such vehicles in this otherwise very complete table.

Buyers will find general particulars, enabling them to form a good all-round impression of each vehicle—such as price, speed, &c.—in the left-hand columns, under the heading, "Leading Characteristics." Other useful data are included under "Constructional Details" in order to assist purchasers to obtain more minute information. Cars have been classified, primarily, according to their number of cylinders—or the equivalent in the case of double-acting steam engines—and they have been further arranged, in each category, in order of price.

LEADING CHARACTERISTICS.						CONSTRUCTIONAL DETAILS.																								Country of Origin.	Last Described in The Automotor Journal.	
Description.	Seating Capacity.	Geared to m.p.h.	Drive.	Price.		Engine.									Transmission.								Bearings.				Dimensions.					
				Chassis.	With Standard Body.	Type.	Bore.	Stroke.	Normal Speed.	Piston Displacement, 10,000 cub. ins. per min	Ignition.	Fuel Feed.	Lubrication.	Control.	Clutch.	Change-speed-gear.	Number.	"Direct."	Speeds.				Engine.	Gear.	Rear Wheels.	Front Wheels	Wheel Base.	Extreme Width.	Driving Tyres.			
																			1st.	2nd.	3rd.	4th.									Vol	Page
Eight-Cylinder Cars.																																
h.p.				£	£		mm. or ins.		r.p.m.										m.p.h.								ft. ins.	ft. ins.	mm. or ins.			
20 Rolls-Royce ...	6	26	S	—	1,220	D	3¼	3¼	1000	21·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	11	18	26	—	P	B	P	B	7 6	4 4	820 × 120	B	X	1380
20 R.R. "Legalimit"	3	26	S	—	1,160	D	3¼	3¼	1000	21·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	11	18	26	—	P	B	P	B	8 10	4 4	820 × 120	B	X	1380
90 Leader	2	84	S	*1,045*	1,055	V	6	7½	700	118·8	*b*	*g*	*p*	G	*md*	S	3	*3rd*	—	—	84	—	P	R	R	R	14 0	4 3	36 × 5	B	—	—
60 Leader	5	56	S	*990*	1,050	V	5	6	800	75·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	14	26	56	—	P	R	R	R	14 0	4 3	34 × 5	B	—	—
Six-Cylinder Cars.																																
60 Napier	5	52¼	S	*1,500*	—	V	5	4	1600	72·1	*b(m)*	*p*	*p*	G	*mc*	S	3	*3rd*	19½	34½	52¼	—	P	R	B	B	10 9	4 8	895 × 135 *f*	B	XI	33
40 Napier	5	46	S	*1,250*	—	V	4	4	1650	50·3	*b(m)*	*p*	*p*	G	*mc*	S	3	*3rd*	18	30	46	—	P	R	B	B	10 4½	4 8	880 × 120 *f*	B	XI	33
40 Napier	5	44	CC	*1,050*	—	V	4	4	1650	50·3	*b(m)*	*p*	*p*	G	*mc*	S	3	*3rd*	15	28	44	—	P	B	P	P	9 8	4 8	880 × 120 *f*	B	XI	33
35-50 Vinot	5	50	CC	*930*	1,000	V	103	130	900	36·0	*b, m*	*p*	*p*	G	*lc*	S	4	*4th*	10	18	34	50	P	B	P	B	10 1	4 5	880 × 120 *f*	F		
30 Clement	5	48	CC	*895*	—	V	95	130	950	32·1	*b, m*	*p*	*p*	H	*md*	S	4	*4th*	12	18	32	48	P	B	B	B	11 5½	4 7	880 × 120	F	X	1465
30 Gladiator	5	—	CC	*890*	—	V	90	130	1000	30·0	*b, m*	*g*	—	G	*md*	S	4	*4th*	—	—	—	—	P	—	B	B	10 5½	4 7	880 × 120	F	X	1411
30 Clement	5	48	CC	*890*	—	V	95	130	950	32·1	*b, m*	*p*	*p*	H	*md*	S	4	*4th*	12	18	32	48	P	B	B	B	10 5½	4 7	880 × 120	F	X	1465
35-40 Ariel-Simplex	5	42	S	*845*	945	V	4¾	5½	1000	58·7	*b(m)*	*p*	*p*	H	*lc*	S	4	*4th*	12	24	36	42	P	B	B	B	10 5	4 6½	34 × 5	B	IX	258
30 Rolls-Royce ...	7	38	S	*840*	945	V	4	5	1000	37·5	*b*	*g*	*p*	G	*lc*	S	4	*3rd*	11	18	31	38	P	B	P	P	9 10	4 4	880 × 120	B		
30-40 Maudslay ...	5	58	CC	*825*	960	V	4½	4	950	32·4	*b(m)*	*g*	*p*	H	*lc*	S	4	*3rd*	9	26	40	58	P	B	B	B	9 10	4 5	935 × 135	B		
24-30 Belsize	5	40	S	*820*	875	V	4	4¼	850	27·0	*b*	*g*	*g*	H	*md*	S	3	*3rd*	10	25	40	—	P	P	P	P	10 1	—	880 × 120	B		
36 Thornycroft ...	5	31	S	*800*	900	V	4¼	5	1000	37·6	*b, M*	*g*	*p*	G	*lc*	S	3	*3rd*	7	12	31	—	P	P	P	P	11 6	4 4	920 × 120	B		
24-30 Standard ...	5	45	S	*675*	750	V	4	4¼	1000	31·5	*b, m*	*g*	*p*	H	*sd*	S	4	*3rd*	10	20	33	45	P	B	B	B	11 0	4 6	885 × 120	B		
35 Orleans	5	38	S	—	850	V	4⅜	4⅞	900	39·6	*b(m)*	*g*	*p*	H	*lc*	S	3	*3rd*	12	24	38	—	P	B	B	B	10 3	—	875 × 120 *f*	B		
18-24 Wilson-Pilcher...	4	30	S	*665*	850	H	3¾	3¾	1000	24·3	*b*	*g*	*p*	G	*md*	E	4	*4th*	8	12	20	30	P	P	P	P	9 3	4 3	915 × 105	B	IX	463
24-30 Standard ..	5	45	S	*650*	725	V	4	4¼	1000	31·5	*b, m*	*g*	*p*	H	*sd*	S	4	*3rd*	10	20	33	45	P	B	B	B	10 0	4 6	885 × 120	B		
28 Brooke	5	40	S	*600*	680	V	3⅝	4¾	1000	29·5	*M*	*p*	*g*	G	*md*	S	4	*3rd*	10	20	30	40	P	B	B	B	10 0	4 6	880 × 120 *f*	B		
20-25 Singer	5	40	S	*600*	675	V	80	90	1600	26·4	*b*	*g*	*p*	H	*lc*	S	4	*4th*	8	16	32	40	P	P	B	B	8 8	4 6	32 × 3½	B		
24 Newmobile	4	25	S	*500*	—	V	100	110	1000	31·2	*b, m*	*g*	*g*	G	*dc*	U	2	*2nd*	8	25	—	—	P	P	R	B	9 0	4 2	815 × 105	B, f		
Four-Cylinder Cars.																																
70 Du Cros Mercedes	5-7	64	CC	*1,800*	1,900	V	140	150	1100	61·8	*M*	*p*	*p*	G	*sc*	S	4	*4th*	7	37	48	64	B	B	B	B	11 1	5 0	920 × 125 *f*	G	X	1201
60 Gobron-Brillie ...	5	70	CC	*1,400*	—	V	120	200	600	33·0	*b, m*	*g*	*g*	H	*dc*	S	4	*4th*	12	26	50	70	P	P	B	B	10 6	—	920 × 120	F	X	280
60-80 Metallurgique ...	5	90	S	*1,350*	1,450	V	140	150	1200	67·5	*b, m*	*g*	*p*	H	*ex*	S	3	*3rd*	30	47	90	—	P	B	B	B	9 10	—	880 × 120 *f*	Be		
60 De Dietrich ...	5	—	CC	*1,320*	1,420	V	150	175	900	64·5	*M*	*p*	*p*	H	*lc*	S	4	—	—	—	—	—	P	B	—	B	10 11	4 8	920 × 120 *f*	F	X	795
40 Metropolitan ...	6	30	CC	*1,300*	1,500	V	5⅝	5¾	1000	52·5	*b, m*	*g*	—	H	*lc*	S	4	*3rd*	8	14	22	30	R	R	R	R	11 6	—	36 × 5 *f*			
60 De Dietrich ...	5	—	CC	*1,280*	1,380	V	150	175	900	64·5	*M*	*p*	*p*	H	*lc*	S	4	—	—	—	—	—	P	B	—	B	10 3	4 8	920 × 120 *f*	F		
70 Siddeley	—	60	CC	*1,250*	—	V	6½	6	1000	80·0	*M(b)*	*p*	*p*	G	*lc*	S	3	—	24	41	60	—	P	B	B	B	10 11	—	36 × 5 *f*	B	X	528

50 Panhard	5	50	CC	*1,240*	1,375	V	160	175	900	77·4	*b, m*	*g*	*p*	G	*md*	S	4	*4th*	12	22	33	50	P	B	B	B	10 6	5 0	935 × 135 *f*	F	X	1423
45 Du Cros Mercedes	5–7	54	CC	*1,200*	1,275	V	120	150	1100	45·8	*M*	*p*	*p*	G	*sc*	S	4	*4th*	14	31	41	54	B	B	B	B	10 8	4 10	920 × 120 *f*	G	IX	219
45 Napier	—	65	S	*1,200*	—	V	130	100	1500	48·6	*b*	*p*	*p*	G	*mc*	S	3	*3rd*	—	—	65	—	P	P	P	P	9 1	4 6	850 × 120 *f*	B		
45-50 Mors	7	75	CC	*1,140*	1,340	V	125	165	1000	49·2	*b, m*	*g*	*g*	G	*ba*	S	4	*4th*	10	25	45	75	B	B	P	P	9 0	4 8	880 × 120	F		
40 Léon Bollée ..	7	50	CC	*1,100*	1,250	V	130	150	900	44·0	*b, m*	*g*	*p*	G	*lc*	S	4	—	10	24	34	50	P	B	B	B	9 6	4 6	920 × 120 *f*	F		
35 Panhard	5–10	45	CC	*1,080*	1,200	V	125	150	900	40·5	*b, m*	*g*	*p*	G	*md*	S	4	*4th*	10	17	30	45	P	B	B	B	10 0	4 10	920 × 135 *f*	F		
40 Richard-Brasier .	5	55	CC	*1,050*	1,140	V	130	140	900	40·5	*M*	*g*	*p*	G	*lc*	S	4	*4th*	12	20	36	55	P	B	B	B	10 0	4 7	920 × 120 *f*	F	X	1050
35 Renault ..	4–8	66	S	*1,040*	1,290	V	130	140	700	31·5	*m*	*g*	*p*	G	*lc*	S	4	*4th*	12	30	45	66	P	B	B	B	9 7	4 9	920 × 120 *f*	F		
40-50 Delaunay Belleville	6	—	CC	*1,040*	1,170	V	130	140	1000	45·0	*M*	*g*	*p*	G	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	10 0	4 10	920 × 120 *f*	F	X	957
40-50 Rochet-Schneider	7	50	CC	*1,040*	11,50	V	140	140	900	46·8	*b, M*	*p*	*p*	G	*mc*	S	4	*4th*	12	25	35	50	P	B	B	B	10 0	4 9	920 × 120	F		
40-50 De Dietrich ..	5	—	CC	*1,040*	1,140	V	130	160	800	41·3	*M*	*p*	*p*	H	*lc*	S	4	—	—	—	—	—	P	P	B	B	10 8	4 8	920 × 120 *f*	F	X	795
35 Du Cros Mercedes	7	49	CC	*1,010*	1,075	V	110	140	1100	35·7	*M*	*p*	*p*	G	*sc*	S	4	*4th*	13	28	37	49	P	B	B	B	10 6	4 9	920 × 120 *f*	G	IX	819
35 Germain	5	—	CC	*1,000*	1,190	V	5½	6$\frac{3}{10}$	850	51·0	*b, m*	*g*	*g*	G	*lc*	S	4	—	—	—	—	—	P	P	B	B	10 4	4 9	920 × 120	Be		
40-50 De Dietrich ...	5	—	CC	*1,000*	1,100	V	130	160	800	41·3	*M*	*p*	*p*	H	*lc*	S	4	—	—	—	—	—	P	P	B	B	10 0	—	920 × 120 *f*	F	X	795
40 Richard-Brasier ...	5	55	CC	*1,000*	1,090	V	130	140	900	40·5	*M*	*g*	*p*	G	*lc*	S	4	*4th*	12	20	36	55	P	B	B	B	9 5	4 7	920 × 120 *f*	F	X	1050
60 Berliet	5	69	CC	*1,000*	1,075	V	140	140	800	41·6	*M*	*p*	*p*	G	*ex*	S	4	—	15	23	37	69	P	B	B	B	10 4	4 6	920 × 120 *f*	F		
30 Westinghouse ...	—	31	CC	*1,000*	—	V	120	140	800	30·7	*m*	*p*	*g*	G	*md*	S	4	*4th*	8	15	24	31	P	B	B	B	—	—	935 × 135 *f*	F		
35 Daimler	7	43	CC	*990*	1,140	V	134	150	650	33·5	*b(m)*	*p*	*g*	H	*lc*	S	4	—	14	24	33	43	P	B	B	B	11 0	4 7	920 × 120	B	X	1422
50 Pipe	5	52	CC	*960*	1,125	V	135	145	1000	50·8	*b, m*	*g*	*g*	H	*mc*	S	4	*4th*	16	24	38	52	P	B	B	B	10 3	4 9½	920 × 120 *f*	Be		
40-45 Metallurgique ...	5	60	S	*950*	1,050	V	119	140	1200	45·5	*b, m*	*g*	*p*	H	*ex*	S	4	*4th*	12	25	39	60	P	B	B	B	9 10	—	880 × 120 *f*	Be		
35 Gobron-Brillie ...	—	50	CC	*950*	—	V	100	180	600	20·8	*b, m*	*g*	—	H	*dc*	S	4	*4th*	12	24	35	50	P	P	B	B	10 6	—	920 × 120	F	X	280
35 Daimler	7	43	CC	*940*	1,090	V	134	150	650	33·5	*b(m)*	*p*	*g*	H	*lc*	S	4	—	14	24	33	43	P	B	B	B	10 0	4 3	920 × 120	B	X	1422
45 Decauville	5	—	CC	*910*	—	V	140	150	1000	56·1	*b, m*	*p*	*p*	F	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	—	—	920 × 120	F		
35-40 Rochet-Schneider	7	45	CC	*900*	1,050	V	140	160	800	48·0	*M*	*p*	*p*	G	*mc*	S	4	*4th*	11	24	35	45	P	B	B	B	10 8	4 9	920 × 120	F		
40-60 Pilain	6	45	S	*900*	1,050	V	140	140	900	46·8	*M*	*p*	*p*	G	*ex*	U	3	123	18	33	45	—	P	—	B	B	9 4	4 6	920 × 125	F		
40-50 Brouhot	5	—	CC	*900*	1,050	V	—	—	1000	—	*m*	*g*	—	G	*ex*	S	4	—	—	—	—	—	P	P	B	B	8 6	—	880 × 105	F		
30 Peugeot	5	55	CC	—	1,050	V	130	120	1250	49·0	*M*	*g*	*p*	G	*lc*	S	4	*4th*	15	25	39	55	P	B	B	B	10 4	4 10	920 × 120	F		
35 Daimler	5	43	CC	*890*	1,000	V	134	150	650	33·5	*b(m)*	*p*	*g*	H	*lc*	S	4	—	14	24	33	43	P	B	B	B	8 8	4 3	880 × 120	B	X	1422
30-45 Vinot	5	45	CC	*880*	920	V	115	140	900	31·6	*b, m*	*p*	*p*	G	*lc*	S	4	*4th*	9	17	28	45	P	B	B	B	9 10	4 5	880 × 120 *f*	F		
30 C.G.V.	7	45	CC	*860*	1,150	V	115	150	750	28·2	*b, m*	*g*	*g*	H	*lc*	S	4	*4th*	10	16	30	45	P	B	B	B	9 10	4 9½	880 × 120 *f*	F		
45 Twentieth Century ...	5–7	59	S	*850*	975	V	130	160	1000	51·6	*b, m*	*p*	*p*	G	*lc*	S	4	*4th*	16	34	45	59	P	B	B	B	10 6	4 9	920 × 120 *f*	B		
28-32 Delaunay-Belleville	6	—	CC	*850*	970	V	115	130	1000	32·6	*M*	*g*	*p*	G	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	10 0	4 10	880 × 120	F	X	975
40 Crossley	5	—	CC	*850*	950	V	121	153	1000	40·7	*M*	*g*	*p*	H	*ex*	S	4	—	—	—	—	—	P	B	B	B	10 0	4 7	920 × 120 *f*	B, f	X	1356
20-25 Du Cros Mercedes	5–7	40	CC	*850*	900	V	100	130	1100	27·5	*M*	*p*	*p*	G	*sc*	S	4	—	11	22	32	40	P	B	B	B	10 0	4 4	880 × 120 *f*	G	IX	219
40 Londonia	7	61	S	*850*	900	V	150	150	1000	64·7	*b, m*	↑	↑	G	*md*	S	4	*4th*	14	36	47	61	P	B	B	B	11 0	4 10	920 × 120	B		
30 C.G.V.	5	45	CC	*840*	1,050	V	115	150	750	28·2	*b, m*	*g*	*g*	H	*lc*	S	4	*4th*	10	16	30	45	P	B	B	B	9 4	4 9½	880 × 120 *f*	F		
24-30 De Dietrich ...	5	—	CC	*840*	940	V	120	120	800	26·5	*M*	*p*	*p*	H	*lc*	S	4	—	—	—	—	—	P	P	B	B	10 6	4 8	920 × 120 *f*	F	X	795
35 Clement Talbot ...	5	60	CC	*820*	—	V	120	140	1200	46·0	*b, m*	*g*	*p*	H	*md*	S	4	*4th*	14	30	45	60	P	B	B	B	9 8	4 7	920 × 120	F		
24-32 Mors	5	60	CC	*820*	—	V	108	150	1000	33·6	*b, M*	*g*	*g*	G	*ba*	S	4	*4th*	8	16	30	60	B	B	P	P	8 2½	4 8	880 × 120	F		
30-45 Vinot	5	45	CC	*810*	890	V	115	130	900	31·6	*b, m*	*p*	*p*	G	*lc*	S	4	*4th*	9	17	28	45	P	B	B	B	9 2	4 5	880 × 120 *f*	F		
30-35 Rochet-Schneider	8	40	CC	*800*	950	V	120	120	800	26·5	*M*	*g*	*g*	G	*mc*	S	4	*4th*	10	20	30	40	P	B	B	B	9 9	4 9	920 × 120	F		
30-40 Martini	6	60	CC	*800*	950	V	125	140	1000	41·0	*M*	*p*	*p*	H	*ex*	S	4	*4th*	—	—	—	60	B	B	B	B	9 8½	4 7½	920 × 120 *f*	S		
24-30 Rochet-Schneider	7	45	S	*800*	950	V	120	140	800	30·7	*M*	*p*	*p*	G	*mc*	S	4	*4th*	10	20	30	45	P	B	B	B	9 7	4 7	920 × 120	F		
24 Panhard	5	40	CC	*800*	935	V	110	140	900	29·3	*b, m*	*g*	*p*	G	*md*	S	4	*4th*	9	16	27	40	P	B	B	B	10 0	4 9	920 × 120	F	X	1423
24-30 De Dietrich ...	5	—	CC	*800*	900	V	120	120	800	26·5	*M*	*p*	*p*	H	*lc*	S	4	—	—	—	—	—	P	P	B	B	9 10	4 8	920 × 120 *f*	F	X	795
24-28 Leon Bollée ...	7	40	CC	*800*	900	V	105	130	900	25·0	*b, m*	*g*	*p*	G	*lc*	S	4	—	10	20	28	40	P	B	B	B	9 6	4 6	920 × 120	F		
50 Thomas Flyer ...	7	60	CC	—	892	V	5½	5½	1000	52·5	*b, m*	*p*	*p*	H	*sd*	S	4	—	—	--	—	60	B	B	B	B	9 8	4 8	34 × 5 *f*	A		
30-35 Metallurgique ...	5	56	S	*800*	890	V	108	140	1200	37·4	*b, m*	*g*	*p*	H	*ex*	S	4	*4th*	10	22	37	56	P	B	B	B	9 10	—	880 × 120	Be	X	589
40 Berliet	5	61	CC	*800*	875	V	120	140	800	30·7	*M*	*p*	*p*	G	*ex*	S	4	—	13	21	33	61	P	B	B	B	9 3	4 6	920 × 120 *f*	F		
40 Darracq	5	50	S	*800*	849	V	130	130	1000	42·0	*b, M*	*g*	*p*	G	*lc*	S	3	*3rd*	15	30	50	—	P	B	B	B	10 4	4 5	880 × 120	F		
18 Napier	—	43	CC	*800*	—	V	90	100	1600	24·8	*b*	*g*	*p*	G	*lc*	S	4	—	10	21	32	43	P	P	P	P	7 6	4 2	875 × 105 *f*	B	X	1459
30 Daimler	7	39	CC	*790*	940	V	124	150	650	28·6	*b(m)*	*p*	*g*	H	*lc*	S	4	—	13	22	31	39	P	B	B	B	11 0	4 7	920 × 120	B	X	1422
32 Siddeley	5	44	CC	*775*	—	V	5¼	5	900	39·0	*M(b)*	*p*	*p*	G	*lc*	S	4	—	11	22	33	44	P	B	P	B	11 8	—	36 × 5 *f*	B	X	1491
30-35 Rochet-Schneider	6	40	CC	*760*	860	V	120	120	800	26·5	*M*	*g*	*g*	G	*mc*	S	4	*4th*	10	20	30	40	P	B	B	B	9 9	4 9	920 × 120	F		
24 Morgan	7	40	S	*750*	900	V	4¼	5⅝	1000	31·8	*b, m*	*p*	*p*	H	*hy*	S	4	*4th*	10	20	30	40	P	B	B	P	10 6	—	34 × 5	B		
24-40 F.I.A.T. ..	5	54	CC	*750*	895	V	125	150	800	36·0	*M*	*p*	*g*	G	*md*	S	4	—	12	22	38	54	P	B	B	B	11 0	4 7	920 × 120 *f*	I	X	889
35-40 Iris	5	52	S	*750*	875	V	5	5¼	750	30·8	*b*	*p*	*p*	H	*md*	S	3	*3rd*	16	28	52	—	P	B	B	B	10 0	4 5	880 × 120 *f*	B	X	1377

Four-cylinder Cars—*continued.*

LEADING CHARACTERISTICS.						CONSTRUCTIONAL DETAILS.																												
				Price.		Engine.									Transmission.								Bearings.				Dimensions.						Last Described in The Automotor Journal.	
																			Speeds.															
Description.	Seating Capacity.	Geared to m.p.h.	Drive.	Chassis.	With Standard Body.	Type.	Bore.	Stroke.	Normal Speed.	Piston Displacement, 10,000 cub. ins. per min.	Ignition.	Fuel Feed.	Lubrication.	Control.	Clutch.	Change-speed-gear.	Number.	"Direct."	1st.	2nd.	3rd.	4th.	Engine.	Gear.	Rear Wheels.	Front Wheels.	Wheel Base.		Extreme Width.		Driving Tyres.	Country of Origin.	Vol.	Page.
h.p.				£	£		mm or ins		r.p.m.										m.p.h.								ft.	ins.	ft.	ins.	mm. or ins.			
32 Siddeley	4	44	CC	*750*	875	V	5¼	5	900	39·0	*M(b)*	*p*	*p*	G	*lc*	S	4	—	11	22	33	44	P	B	P	B	10	2	—		36 × 5 *f*	B	X	1491
20-24 Delaunay-Belleville	6	—	CC	*750*	870	V	105	130	1000	26·8	*M*	*g*	*p*	G	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	10	0	4	10	880 × 120	F	X	957
40 Owens Gearless	7	—	S	*750*	850	—	—	—	—	—	*b, m*	*p*	*p*	G	*md*	—	—	—	—	—	—	—	P	—	B	B	10	6	4	10	920 × 120 *f*	B		
24 Gobron Brillie	5	40	CC	*750*	—	V	98	175	600	19·1	*b, m*	*g*	*g*	H	*dc*	S	4	*4th*	8	18	28	40	P	P	B	B	9	6	—		880 × 120 *f*	F	X	280
24-40 F.I.A.T.	5	54	CC	*745*	890	V	125	150	800	36·0	*M*	*p*	*g*	G	*md*	S	4	—	12	22	38	54	P	B	B	B	10	2	4	7	920 × 120 *f*	I	X	889
30 Daimler	7	39	CC	*740*	890	V	124	150	650	28·6	*b(m)*	*p*	*g*	H	*lc*	S	4	—	13	22	31	39	P	B	B	B	10	0	4	3	920 × 120	B	X	1422
24-30 Rochet-Schneider	5	45	S	*740*	840	V	120	140	800	30·7	*M*	*p*	*p*	G	*mc*	S	4	*4th*	10	20	30	45	P	B	B	B	9	1	4	9	920 × 120	F		
25 Richard-Brasier	5	46	CC	*740*	830	V	112	130	1000	31·2	*M*	*g*	*p*	G	*lc*	S	4	*4th*	10	18	30	46	P	B	B	B	9	10	4	6	880 × 120 *f*	F		
20-25 Brotherhood	7	39½	CC	*735*	875	V	4	5	1000	25·0	*b*	*p*	*p*	H	*lc*	S	4	—	11½	19	27½	39½	P	B	B	B	9	9	4	7	880 × 120 *f*	B	X	1417
30-35 Hotchkiss	5	46	S	*730*	830	V	115	120	1250	38·1	*m*	*g*	*p*	H	*lc*	S	4	*4th*	8	16	26	46	B	B	B	B	9	10	4	9	880 × 120 *f*	F	X	343
30-40 Maudslay	7	36	CC	*725*	900	V	5	5	850	33·3	*b(m)*	*g*	*p*	H	*lc*	S	4	*3rd*	10	17	25	36	P	B	B	B	10	7½	4	5	935 × 135	B	X	176
24 De Dion	4	36	S	*725*	825	V	104	130	1500	40·0	*b, m*	*g*	*p*	F	*sd*	S	4	—	12	18	29	36	P	P	P	P	10	6	4	8	880 × 120	F		
24 F.I.A.T.	5	54	CC	*720*	865	V	125	150	800	36·0	*M*	*p*	*g*	G	*md*	S	4	—	12	22	38	54	P	B	B	B	9	6	4	7	920 × 120 *f*	I	X	889
25 Richard-Brasier	5	46	CC	*720*	810	V	112	130	1000	31·2	*M*	*g*	*p*	G	*lc*	S	4	*4th*	10	18	30	46	P	B	B	B	9	5	4	6	880 × 120 *f*	F		
30 Decauville	5	—	S	*710*	—	V	128	130	1000	40·4	*b, m*	*p*	*p*	F	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	9	6	—		920 × 120 *f*	F		
24-30 N.E.C.	6	30	S	*700*	870	H	4½	4½	1250	36·0	*b*	*g*	*g*	G	*lc*	E	2	*2nd*	12	30	—	—	P	P	R	B	10	2	4	10	40 × 3½ *f*	B	X	1413
20-25 Brotherhood	5	39½	CC	*700*	850	V	4	5	1000	25·0	*b*	*p*	*p*	H	*lc*	S	4	—	11½	19	27½	39½	P	B	B	B	9	3	4	7	880 × 120 *f*	B	X	128
26-30 Argyll	7	38	S	*700*	800	V	105	140	1100	32·4	*b, m*	*g*	*p*	G	*md*	U	3	*3rd*	9	19	38	—	P	B	B	B	10	0	4	7	920 × 120	B	X	1257
22 Crossley	5	—	CC	*700*	800	V	110	130	1000	29·6	*M*	*g*	*p*	H	*ex*	S	4	—	—	—	—	—	P	B	B	B	10	0	4	7	920 × 120 *f*	B, f	X	1356
18 Napier	—	43	CC	*700*	—	V	90	100	1600	24·8	*b*	*g*	*p*	G	*lc*	S	4	—	10	21	32	43	P	P	P	P	9	1	4	2	820 × 120 *f*	B	X	1459
28 Daimler	7	35	CC	*690*	840	V	110	150	750	26·0	*b(m)*	*p*	*g*	H	*lc*	S	4	—	12	20	28	35	P	B	B	B	11	0	4	7	920 × 120	B	X	1422
24-30 Whitlock-Aster	5	40	CC	*690*	—	V	105	140	1100	32·4	*b, m*	*g*	*p*	G	*mc*	S	3	*3rd*	15	25	40	—	B	B	P	P	10	6	4	4	880 × 120	F		
30 Daimler	4	39	CC	*690*	800	V	124	150	650	28·6	*b(m)*	*p*	*g*	H	*lc*	S	4	—	13	22	31	39	P	B	B	B	8	8	4	3	880 × 120	B	X	1422
24 Clement-Talbot	5	55	CC	*680*	760	V	100	140	1200	32·1	*b, M*	*g*	*p*	H	*md*	S	4	*4th*	12	25	40	55	P	B	B	B	9	11	4	7	820 × 120	F		
35 Brooke	6	45	CC	*680*	750	V	5½	6	1000	57·7	*M*	*p*	*g*	G	*lc*	S	3	*3rd*	10	30	45	—	P	P	B	B	9	6	4	6	880 × 125	B	X	342
30-40 Belsize	4	40	S	*680*	725	V	4⅝	5	850	29·2	*b*	*g*	*g*	H	*md*	S	3	*3rd*	10	25	40	—	P	P	P	P	10	1	—		880 × 120	B	X	101
20-25 Brotherhood	4	39½	CC	*675*	775	V	4	5	1000	25·0	*b*	*p*	*p*	H	*lc*	S	4	—	11½	19	27½	39½	P	B	B	B	8	3	4	7	870 × 100	B	X	128
24-30 Whitlock-Aster	5	40	CC	*675*	775	V	105	140	1100	32·4	*b, m*	*g*	*p*	G	*mc*	S	3	*3rd*	15	25	40	—	B	B	P	P	9	6	4	4	880 × 120	F		
26-30 Argyll	5	38	S	*675*	750	V	105	140	1100	32·4	*b, m*	*g*	*p*	G	*md*	U	3	*3rd*	9	19	38	—	P	B	B	B	9	3	4	7	920 × 120	B	X	1257
20-30 Maudslay	7	35	CC	*675*	—	V	4½	4	800	20·5	*b*	*g*	*p*	H	*lc*	S	4	*3rd*	10	18	26	35	P	P	P	P	9	4	4	5	880 × 120	B	X	176
28 Pipe	7	40	CC	*660*	900	V	100	120	1000	23·0	*b, m*	*g*	*g*	H	*mc*	S	4	*4th*	12	18	30	40	P	B	B	B	10	3	4	9	880 × 120 *f*	Be		
24 Germain	5	—	CC	*660*	850	V	4½	5½	850	29·8	*b, m*	*g*	*g*	G	*lc*	S	4	—	—	—	—	—	P	P	B	B	8	6	4	9	915 × 105 *f*	Be	IX	164
20 C.G.V.	7	38	CC	*660*	850	V	110	130	750	22·2	*b, m*	*g*	*g*	H	*lc*	S	4	*4th*	8	14	26	38	P	B	B	B	9	10	4	9½	880 × 120 *f*	F		
20 Renault	4-7	55	S	*660*	810	V	100	140	1000	26·8	*m*	*g*	*p*	G	*lc*	S	4	*4th*	8	17	35	55	P	B	B	B	9	0	4	9	880 × 120 *f*	F		
25-29 Hotchkiss	5	46	S	*660*	760	V	112	120	1300	35·7	*b, M*	*g*	*p*	H	*lc*	S	4	*4th*	8	16	26	46	B	B	B	B	9	10	4	9	875 × 105	F	X	343
30-45 Pivot	5	30	S	*660*	750	V	135	140	900	43·8	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	5	18	30	—	P	B	B	B	9	0	4	6	880 × 120 *f*	F	X	503
24-30 New Arrol-Johnston	7	40	S	*650*	800	V	4¼	5	950	27·0	*b, M*	*p*	*p*	G	*md*	S	4	*4th*	10	20	30	40	P	R	R	P	11	0	4	4½	915 × 105	B	X	1409
18 Peugeot	5	46	CC	—	750	V	105	106	1350	30·2	*M*	*g*	*p*	G	*lc*	S	4	*4th*	12½	21	32	46	P	B	B	B	10	2	4	8	915 × 105	F		
25 Siddeley	6	40	CC	*650*	—	V	4½	5	900	28·5	*M(b)*	*p*	*p*	G	*lc*	S	4	—	10	20	30	40	P	B	P	B	11	6	—		36 × 5 *f*	B	X	1491
20-24 Rothwell	5	45	S	*650*	750	V	4	5	1000	25·2	*b, m*	*g*	*p*	G	*lc*	S	3	*3rd*	12	25	45	—	P	B	B	B	9	9	4	8	850 × 120 *f*	B		
25-30 James and Browne	4	44	CC	*650*	710	H	4½	6	600	25·0	*M*	*g*	*p*	G	*mc*	S	4	—	9	22	33	44	P	P	P	P	8	5	4	8	34 × 5 *f*	B		
24 Gladiator	5	—	CC	*650*	—	V	105	140	1000	29·5	*b, m*	*g*	*p*	H	*md*	S	4	*4th*	—	—	—	—	P	B	B	B	10	5½	4	6½	880 × 120 *f*	F	X	1411
24 Dennis	5	36	S	*650*	700	V	105	140	1200	35·3	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	8	18	36	—	P	P	P	P	10	6	4	3	880 × 120	b, f		
20-25 Ariel Simplex	5	45	S	*645*	745	V	4½	5½	1000	39·2	*b(m)*	*p*	*p*	H	*lc*	S	4	*4th*	12	24	33	45	P	B	B	B	9	3	4	6½	34 × 5	B	IX	258

28 Pipe	5	40	CC	640	850	V	100	120	1000	23·0	b, m	g	g	H	mc	S	4	4th	12	18	30	40	P	B	B	B	9	9	4	9	880 × 120 f	Be		
20 C.G.V.	5-7	38	CC	640	800	V	110	130	750	22·2	b, m	g	g	H	lc	S	4	4th	8	14	26	38	P	B	B	B	9	4	4	9½	880 × 120 f	F		
28 Daimler	7	35	CC	640	790	V	110	150	750	26·0	b(m)	p	g	H	lc	S	4	—	12	20	28	35	P	B	B	B	10	0	4	3	920 × 120	B	X	1422
20-24 Martini	5	45	CC	640	780	V	100	136	1000	26·0	M	p	p	H	ex	S	4	4th	—	—	—	45	B	P	B	B	9	2½	4	7½	875 × 105	S		
16-20 Delaunay-Belleville	6	—	CC	640	760	V	90	130	1000	20·4	M	g	p	G	lc	S	4	4th	—	—	—	—	P	B	B	B	10	0	4	10	880 × 120	F	X	957
20-30 Pilain	5	37	S	640	740	V	112	150	850	30·5	M	p	p	G	dc	U	4	3&4	9	17	27	37	P	B	B	B	9	4	4	4½	880 × 120	F		
16-20 De Dietrich ...	5	—	CC	640	740	V	104	120	800	20·0	M	p	p	H	lc	S	4	—	—	—	—	—	P	B	P	P	10	4	4	8	9 0 × 120 f	F	X	795
24 Albion	5	45	CC	632	720	V	4¼	4½	1200	30·6	M	p	p	G	md	S	4	4th	11	18	30	45	P	P	P	P	9	2	4	7	35 × 5	B		
20 Rolls-Royce ...	4	38	S	630	735	V	4	5	1000	25·0	b	g	p	G	lc	S	4	3rd	11	18	31	38	P	B	P	P	8	10	4	4	810 × 100 f	B	IX	1409
24 Clement	5	47	CC	630	—	V	105	140	950	28·1	b, m	p	p	H	md	S	4	4th	12	18	30	47	P	B	B	B	11	5½	4	7	880 × 120 f	F		
24-40 Bianchi... ...	5	—	CC	630	—	V	125	150	1350	61·0	M	p	g	H	md	S	4	—	—	—	—	—	P	P	B	B	—		—		920 × 120 f	I	X	1415
25 Siddeley	5	40	CC	625	750	V	4½	5	900	28·5	M(b)	p	p	G	lc	S	4	—	10	20	30	40	P	B	P	B	10	0	—		36 × 5 f	B	X	1490
24-28 Decauville ...	5	30	S	625	730	V	115	115	1000	29·2	b, m	g	p	F	lc	S	4	4th	5	16	20	30	P	B	B	B	9	2	4	8	880 × 120 f	F		
20-24 Brouhot	5	—	CC	625	725	V	—	—	1000	—	m	g	g	G	ex	S	4	4th	—	—	—	—	P	P	B	B	8	6	—		880 × 105	F		
20-30 Maudslay ...	5	25	CC	625	700	V	4½	4	800	20·5	b	g	p	H	lc	S	3	3rd	6½	14½	25	—	P	P	P	P	9	4	4	5	880 × 120	B	X	176
24 Thornycroft ...	5	31	S	625	690	V	4¼	5	1000	25·1	b(M)	g	p	G	md	S	3	3rd	7	12	31	—	P	P	P	P	10	5½	4	4	920 × 120	B	X	1414
24 Clement	4	47	CC	625	—	V	105	140	950	28·1	b, m	p	p	H	md	S	4	4th	12	17	28	40	P	B	B	B	9	10½	4	6	875 × 105 f	F	X	1465
30 Speedwell	5	48	CC	610	675	V	110	130	1250	37·0	b, m	g	p	G	lc	S	3	3rd	12	24	48	—	P	P	P	P	9	6	4	4	820 × 120	F		
25-32 Dixi	7	40	CC	605	670	V	110	130	1000	29·6	b, m	p	p	H	mc	S	4	4th	6	12	20	40	P	B	B	B	10	6	4	8½	1020 × 120	G	IX	1093
25-30 Iris	5	40	S	600	725	V	4¼	5¼	750	22·5	b	p	p	H	md	S	3	3rd	12	22	40	—	P	B	B	B	10	0	4	5	880 × 120 f	B	X	1377
24-30 New Arrol-Johnston	5	40	S	600	700	V	4¼	5	950	27·0	b, M	p	p	G	md	S	4	4th	10	20	30	40	P	R	R	P	9	6	4	4½	915 × 105	B	X	1409
30 Bell Bros.	5	40	CC	600	700	V	118	115	800	32·0	b, m	p	p	H	md	S	4	4th	8	18	26	40	P	B	B	B	9	9	4	7½	870 × 120 f	B		
16-20 De Dietrich ...	5	—	CC	600	700	V	104	120	800	20·0	M	p	p	H	lc	S	4	—	—	—	—	—	P	B	B	B	9	8	4	8	920 × 120 f	F	X	795
18-22 Rochet-Schneider	5	40	S	600	700	V	100	140	800	21·4	M	p	p	G	mc	S	3	3rd	—	—	40	—	P	B	B	B	9	3	4	3	875 × 105	F		
20 28 Metallurgique ...	5	48	S	600	680	V	100	110	1300	27·2	b, m	g	p	H	ex	S	3	3rd	10	25	48	—	B	B	B	B	9	10	—		820 × 105	Be	X	589
22 Berliet	5	50	CC	600	675	V	100	120	900	20·7	M	p	p	G	ex	S	4	4th	8	17	24	50	P	B	B	B	8	9	4	3	875 × 105 f	F		
20 Dennis	5	34	S	600	650	V	95	130	1200	26·8	b	g	p	G	lc	S	3	3rd	6	17	34	—	P	P	P	P	10	0	4	3	875 × 105	b,f	VIII	898
18 Napier	—	43	CC	600	—	V	90	100	1600	24·8	b	g	p	G	lc	S	4	—	10	21	32	43	P	P	P	P	8	7½	4	2	850 × 120 f	B	X	1459
20 Lanchester	6	—	Sw	—	700	V	4	3	1400	21·0	M	g	p	G	md	E	3	3rd	—	—	—	—	P	R	P	P	10	5	4	10	875 × 105	B		
20-30 Vinot	5	42	CC	595	670	V	103	130	900	24·0	b, m	p	p	G	lc	S	4	4th	8	14	25	42	P	B	B	B	9	2	4	5	875 × 105	F		
28 Daimler	4	35	CC	590	700	V	110	150	750	26·0	b(m)	p	g	H	lc	S	4	—	12	20	28	35	P	B	B	B	8	8	4	3	880 × 120	B	X	1422
25-32 Dixi	5	40	CC	590	650	V	110	130	1000	29·6	b, m	p	p	H	mc	S	4	4th	6	12	20	40	P	B	B	B	9	7	4	8½	1020 × 120 f	G	IX	1093
16-24 F.I.A.T. ...	5	42	CC	590	—	V	110	125	800	23·1	M	p	g	G	md	S	4	—	8	17	28	42	P	B	B	B	10	9	4	7	920 × 120 f	I	X	889
18-22 Rochet-Schneider	5	40	S	580	680	V	100	140	800	21·4	M	p	p	G	mc	S	3	3rd	—	—	40	—	P	B	B	B	8	7	4	3	875 × 105	F		
25-38 Spyker	5	50	S	—	680	V	120	150	800	33·3	b(m)	g	p	H	lc	S	3	3rd	12	24	50	—	P	B	B	B	10	10	4	8	820 × 120	H	IX	669
24-35 Pivot	5	30	S	580	660	V	110	130	900	26·7	b	g	p	G	lc	S	3	3rd	5	18	30	—	P	B	B	B	9	0	4	6	880 × 120 f	F	X	503
15 Richard-Brasier ...	5	40	S	580	660	V	90	120	1000	18·6	M	g	p	G	lc	S	4	4th	8	15	26	40	P	B	B	B	9	11	4	6	875 × 105 f	F		
18-22 James & Browne	4	40	CC	580	630	H	4	6	600	18·6	b, m	g	g	G	mc	S	4	—	9	20	30	40	P	P	P	P	8	5	4	8	34 × 4 f	B		
16-24 F.I.A.T. ...	5	42	CC	580	—	V	110	125	800	23·1	M	p	g	G	md	S	4	—	8	17	28	42	P	B	B	B	9	11	4	7	920 × 120 f	I	X	889
28-32 Mass	5	35	CC	575	650	V	115	135	1100	37·3	b	g	g	G	lc	S	3	3rd	—	—	35	—	P	B	B	P	—		—		880 × 120 f	F		
30 Twentieth Century..	5	42	S	575	650	V	120	130	1000	36·0	b, m	g	p	G	lc	S	3	3rd	15	32	42	—	P	P	P	P	10	0	4	8	920 × 120 f	B		
17-19 Mors	5	45	CC	570	650	V	87	125	1200	22·0	b, M	g	g	G	ba	S	4	4th	2	12	25	45	B	B	B	B	8	0	4	6	880 × 120	F		
25 Orleans	5	36	S	570	625	V	4⅜	4⅞	1000	27·6	b	g	g	H	lc	S	4	4th	10	18	26	36	P	P	P	P	9	8	4	4	815 × 105 f	Be		
14 C.G.V.	5	28	S	560	725	V	100	100	850	14·8	b, m	g	g	H	lc	S	3	3rd	8	20	28	—	P	B	B	B	9	2	4	9½	815 × 105	F		
16-24 F.I.A.T. ...	5	42	CC	560	705	V	110	125	800	23·1	M	p	g	G	md	S	4	—	8	17	28	42	P	B	B	B	9	3	4	7	920 × 120 f	I	X	889
15 Richard-Brasier ...	5	40	S	560	640	V	90	120	1000	18·6	M	g	p	G	lc	S	4	4th	8	15	26	40	P	B	B	B	8	10	4	6	875 × 105 f	F		
25-30 Austin	5	40	S	550	650	V	4½	5	9·0	28·5	b, M	p	p	G	md	S	4	—	14	20	30	40	P	B	B	B	9	9	4	7	920 × 120 f	B	X	1518
30 Star	4	45	CC	550	650	V	5	5	900	35·2	b	p	p	G	lc	S	4	—	12	23	35	45	P	B	B	B	9	6	4	4½	34 × 5	B		
24 Hallamshire ...	5	35	S	550	650	V	105	140	1000	29·5	b	p	p	G	mc	S	3	3rd	10	21	35	—	P	P	P	P	10	4	4	6	880 × 120	b,f		
20 Lanchester	5	36	Sw	550	650	V	4	3	1400	21·0	M	g	p	G	md	E	3	3rd	12	24	36	—	P	R	P	P	9	0	4	10	870 × 90	B		
16-20 Brouhot	5	—	CC	550	650	V	—	—	1000	—	m	g	g	G	ex	S	4	4th	—	—	—	—	P	P	B	B	8	4	—		870 × 90	F		
25-30 Iden	5	35	S	550	630	V	110	130	1100	32·5	b(m)	g	g	H	mc	S	3	3rd	11	19	35	—	P	P	B	B	9	0	4	5	870 × 90	B		
25-30 Vulcan	5	30	S	550	600	V	4	5¾	1000	27·8	b, m	p	p	G	lc	S	3	3rd	8	16	30	—	B	B	B	B	9	0	4	2	880 × 120	B		
18 White (steam) ...	5	—	S	550	600	V	3&5	3½	675	—	—	—	—	—	—	—	—	—	—	—	—	—	B	—	B	B	9	6	4	8	880 × 120 f	A	X	1204
22 Heron-Aster ...	5	35	CC	550	600	V	95	130	1100	25·0	b	g	p	G	lc	S	3	3rd	5	14	35	—	P	B	P	P	9	6	4	4	870 × 90	B, f		
18 Siddeley	5	34	CC	550	—	V	4¼	4	1000	22·6	m(b)	p	g	G	lc	S	4	—	10	17	25	32	P	B	B	B	10	6	—		34 × 4	B	X	1491
20-22 Climax	6	35	S	545	620	V	95	130	1000	22·5	b, m	g	p	G	sd	S	4	4th	10	15	25	35	B	B	B	B	10	0	4	6	880 × 120	B, f		
25 Cottereau	5	45	CC	545	620	V	95	120	1200	25·0	b	g	p	G	lc	S	3	3rd	10	22	45	—	P	B	B	B	9	7	4	4½	875 × 105	F		
14 Renault	6	45	S	540	760	V	90	120	1000	19·5	m	g	p	G	lc	S	3	3rd	7	20	45	—	P	P	B	B	9	7	4	7	875 × 105	F		

LEADING CHARACTERISTICS.						CONSTRUCTIONAL DETAILS.																										Country of Origin.	Last Described in The Automotor Journal.	
				Price.		Engine.									Transmission.								Bearings.				Dimensions.							
																			Speeds.															
Description.	Seating Capacity.	Geared to (m.p.h.)	Drive.	Chassis.	With Standard Body.	Type.	Bore.	Stroke.	Normal Speed.	Piston Displacement, 10,000 cub. ins. per min	Ignition.	Fuel Feed.	Lubrication.	Control.	Clutch.	Change-speed-gear.	Number.	"Direct."	1st.	2nd.	3rd.	4th.	Engine.	Gear.	Rear Wheels.	Front Wheels.	Wheel Base.		Extreme Width.		Driving Tyres.		Vol.	Page
Four-cylinder Cars—*continued.*																																		
h.p.				£	£		mm. or ins.		r.p.m										m.p.h.								ft.	ins.	ft.	ins.	mm. or ins.			
16 **Germain**	5	—	CC	*540*	630	V	3⅛	5⅛	850	19·2	*b, m*	*g*	*g*	G	*lc*	S	4	—	—	—	—	—	P	P	B	B	10	2	4	9	915 × 105	Be	IX	164
18-24 **Belsize**	4	30	S	*540*	600	V	4	4¼	850	18·3	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	8	18	30	—	P	P	P	P	8	0	—		820 × 120	B	X	101
26 Simms Welbeck ...	5	42	S	*539*	700	V	110	110	1000	25·3	*M*	*g*	*p*	G	*lc*	S	3	*3rd*	12	25	42	—	P	P	P	P	10	2	4	5	815 × 105	B	X	704
20 Clement-Talbot ...	5	52	S	*530*	590	V	100	120	1400	32·2	*b, m*	*g*	*p*	H	*mt*	S	4	*4th*	11	24	38	52	P	B	B	B	9	8	4	7	870 × 100	B	IX	340
20 Darracq	7	43	S	*530*	569	V	112	120	1000	28·8	*b(M)*	*g*	*p*	G	*lc*	S	3	*3rd*	13	28	43	—	P	B	B	B	10	8	4	5	880 × 120 *f*	F		
18 **Gladiator**	5	—	CC	*530*	—	V	95	130	1200	26·8	*b, m*	*g*	*g*	H	*md*	S	4	*4th*	—	—	—	—	P	B	B	B	9	9	4	6	880 × 120 *f*	F	X	1411
18 **Clement**	5	40	S	*530*	—	V	95	130	950	21.4	*b, m*	*p*	*p*	H	*md*	S	4	*4th*	12	17	28	40	P	B	B	B	10	10½	4	6½	875 × 105 *f*	F	X	1465
26 Simms Welbeck ...	5	42	S	*529*	585	V	110	110	1000	25·3	*M*	*g*	*p*	G	*lc*	S	3	*3rd*	12	25	42	—	P	P	P	P	9	2	4	5	815 × 105	B	X	704
16-22 **Bianchi** ...	5	—	CC	*525*	650	V	105	130	1350	37·2	*M*	*p*	*g*	H	*md*	S	4	—	—	—	—	—	P	P	B	B	9	9	—		875 × 105 *f*	I	X	1415
20 Bayley	5	35	S	—	650	V	105	110	1200	28·0	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	12	24	35	—	P	P	B	B	8	4	—		34 ×	—		
18 **Siddeley**	4	34	CC	*525*	600	V	4¼	4	1000	22·6	*m(b)*	*p*	*g*	G	*lc*	S	4	—	10	17	25	34	P	B	B	B	9	6	—		34 × 4	B	X	1491
20–28 Spyker	5	40	S	—	600	V	110	120	800	21·6	*b(m)*	*g*	*p*	H	*lc*	S	3	*3rd*	12	24	40	—	P	B	B	B	10	3	4	8	815 × 105	H	IX	669
22 Orleans	4	33	S	*525*	575	V	100	116	1000	22·3	*b, m*	*g*	*p*	H	*lc*	S	3	*3rd*	11	22	33	—	P	B	B	B	9	8	4	6	815 × 105 *f*	Be		
22 Heron Aster ...	5	35	S	*525*	575	V	95	130	1100	25·0	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	5	14	35	—	P	B	P	P	9	6	4	4	870 × 90	B, f		
18 **Gladiator**	5	—	CC	*525*	—	V	95	130	1200	26·8	*b, m*	*g*	*g*	H	*md*	S	4	*4th*	—	—	—	—	P	B	B	B	8	9	4	6	880 × 120	F	X	1411
18 **Clement**	4	40	S	*525*	—	V	95	130	950	21·4	*b, m*	*p*	*p*	H	*md*	S	4	*4th*	12	17	28	40	P	B	B	B	9	10½	4	6	875 × 105 *f*	F	X	1465
20 Darracq	5	43	S	*522*	549	V	112	120	1000	28·8	*b(M)*	*g*	*p*	G	*lc*	S	3	*3rd*	13	28	43	—	P	B	B	B	10	1	4	5	880 × 120 *f*	F		
16-20 **Argyll**	6	35	S	*520*	690	V	95	130	1100	25·0	*b*	*g*	*p*	G	*md*	U	3	*3rd*	9	17	35	—	P	B	B	B	9	9	4	1	875 × 105	B	X	1257
14 Renault ... —	4	45	S	*520*	690	V	90	120	1000	19·5	*m*	*g*	*p*	G	*lc*	S	3	*3rd*	7	20	45	—	P	P	B	B	9	0	4	7	875 × 105	F		
16–20 Pilain	5	33	S	*520*	620	V	100	130	900	22·5	*M*	*p*	*p*	G	*d*	U	4	*3 & 4*	7	16	23	33	P	B	B	B	8	2	4	3	875 × 105 *f*	F		
20–24 Horbick... ...	5	38	S	*520*	600	V	107	114	1000	25·0	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	8	20	38	—	P	P	P	P	8	8	5	0	815 × 105	B		
22 Climax	5	32	S	*520*	595	V	95	130	1000	22·5	*b, m*	*g*	*p*	G	*sd*	S	4	*4th*	10	15	25	35	B	B	B	B	9	0	4	6	875 × 105	B, f		
18-24 Vulpus	6	—	CC	*520*	595	V	100	120	1000	23·0	*m*	*g*	*g*	G	*lc*	S	3	*3rd*	—	—	—	—	P	P	B	B	—		—		875 × 105	F		
15-20 **Brooke**	6	30	CC	*510*	590	V	3⅝	4¾	950	18·8	*M*	*p*	*g*	G	*lc*	U	3	—	10	20	30	—	P	P	P	P	10	0	4	6	880 × 120 *f*	B	IX	365
14-20 **Vinot**	5	35	CC	*510*	580	V	90	130	900	18·3	*b, m*	*p*	*p*	G	*lc*	S	4	*4th*	7	13	23	35	P	B	B	B	9	2	4	5	875 × 105	F		
16-20 Decauville ..	5	—	S	*505*	560	V	100	105	1000	22·4	*b, m*	*g*	*p*	F	*lc*	S	3	*3rd*	—	—	—	—	P	B	B	B	9	0	4	5	875 × 105	F		
12-15 **De Dietrich** ...	5	—	CC	*500*	580	V	90	120	800	15·6	*m*	*p*	*p*	H	*lc*	S	4	—	—	—	—	—	P	P	P	B	8	4	4	8	870 × 90	F	X	1463
16-24 Pivot	5	30	S	*500*	580	V	98	120	900	20·0	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	5	18	30	—	P	B	B	B	9	0	4	6	880 × 120 *f*	F	X	503
16-20 Standard ...	5	40	S	*500*	575	V	4	4¼	1000	21·0	*b*	*g*	*g*	H	*sd*	S	4	*3rd*	10	20	30	40	P	B	B	B	10	0	4	6	875 × 105 *f*	B		
20 Mascot	5	35	S	*500*	575	V	95	130	1100	25·0	*b, m*	*g*	*p*	G	*lc*	S	3	*3rd*	9	18	35	—	P	P	B	B	9	8	—		875 × 105	F		
30 Leader	5	56	S	*500*	550	V	5	6	800	37·7	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	14	26	56	—	P	R	R	B	11	0	4	3	34 × 4½	B		
15 **White (steam)** ..	5	—	S	*500*	550	V	3 & 5	3½	—	—	—	—	—	—	—	—	-	—	—	—	—	—	B	B	B	B	7	9	4	8	870 × 90	A	IX	1437
18 **Regent**	4	35	S	*500*	550	V	90	120	1200	23·4	*M*	*p*	*p*	G	*lc*	S	3	*3rd*	10	20	35	—	P	B	B	B	9	3	—		810 × 90	G	X	1230
25 **Winton**	5	42	S	*500*	550	V	4¾	5	950	33·0	*b*	*g*	*p*	G	*mc*	U	2	*2nd*	—	42	—	—	P	P	R	R	8	7	4	6	34 × 4	A	X	1461
24–30 Burke	5	—	S	*500*	—	V	—	—	1000	—	*b, m*	*g*	*g*	G	*lc*	S	3	—	—	—	—	—	P	B	—	—	9	3½	4	3½	880 × 120 *f*	—		
12 Peugeot	5	38	CC	—	550	V	85	95	1400	18·6	*M*	*g*	*p*	G	*lc*	S	4	*4th*	9½	17	25	38	P	B	B	B	9	4	4	6	815 × 105	F		
16-20 **Argyll**	5	35	S	*495*	550	V	95	130	1100	25·0	*b*	*g*	*p*	G	*md*	U	3	*3rd*	9	17½	35	—	P	B	B	B	9	0	4	1	875 × 105	B	X	1257
15-24 Spyker	5	35	S	*495*	520	V	100	110	1000	22·3	*b(m)*	*g*	*p*	H	*lc*	S	3	*3rd*	8	20	35	—	P	P	B	B	8	9	4	8	810 × 90	H	IX	669
15-20 **Brooke**	4	30	CC	*490*	550	V	3⅝	4¾	950	18·8	*M*	*p*	*g*	G	*lc*	U	3	*3rd*	10	20	30	—	P	P	P	P	7	9	4	6	875 × 105	B	IX	365
15 **De Dion**	4	30	S	*490*	540	V	90	100	1500	23·3	*b, m*	*g*	*p*	F	*sd*	S	3	—	9	18	30	—	P	P	P	P	8	10	4	1	815 × 105	F	IX	1319
18-22 Whitlock-Aster ...	5	35	CC	*487*	585	V	95	130	1200	27·5	*b*	*g*	*p*	G	*mc*	S	3	*3rd*	15	25	35	—	B	B	P	P	9	10	4	4	810 × 90	F		
20 Crawshay-Williams	5	35	CC	*485*	575	V	100	130	900	22·5	*b*	*p*	*g*	H	*md*	S	4	—	8	15	29	35	P	B	B	B	9	6	4	7	920 × 120 *f*	B		
18 **Cupelle**	5	—	S	*485*	525	V	90	110	1300	22·0	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	—	—	—	—	P	P	B	B	10	6	4	9	815 × 105	F	X	559
15 **Panhard**	5	32	CC	*480*	595	V	90	130	900	18·3	*b, m*	*g*	*p*	G	*lc*	S	4	—	7	14	22	32	P	P	B	B	9	3	4	7½	880 × 120 *f*	F		
20 **Ryknield**	5	42	S	*480*	550	V	4	4½	1000	22·4	*m*	*g*	*p*	H	*lc*	S	4	*4th*	9	17	28	42	P	B	B	B	9	0	—		810 × 90	B		
24-30 **Royal Enfield** ...	5	36	S	*480*	550	V	120	135	900	33·2	*b, m*	*p*	*p*	G	*lc*	S	3	*3rd*	10	20	36	—	B	B	B	B	9	0	4	7	820 × 120 *f*	B		

16 20 Sunbeam ...	5	40	CC	*480*	530	V	95	120	800	16·7	*m*	*g*	*p*	H	*lc*	S	4	*4th*	10	20	30	40	P	P	P	P	9	7	4	4	880 × 120 *f*	B		
14-16 James & Browne	4	36	CC	*480*	530	H	3½	4½	800	13·9	*b*	*g*	*g*	G	*mc*	S	4	—	8	18	27	36	P	P	P	P	8	5	4	2	34 × 3½	B		
16-20 Standard ...	5	42	S	*475*	550	V	4	4¼	1000	21·0	*b*	*g*	*g*	H	*sd*	S	4	*3rd*	10	20	30	40	P	B	B	B	9	0	4	6	875 × 105	B		
18-22 Whitlock-Aster ...	2	35	CC	*475*	550	V	95	130	1200	27·5	*b*	*g*	*p*	G	*mc*	S	3	*3rd*	15	25	35	—	B	B	P	P	9	0	4	4	810 × 90	F		
14 **Thornycroft** ...	5	31	S	*475*	540	V	3¾	3¾	1000	16·4	*b(M)*	*g*	*p*	G	*md*	S	3	*3rd*	7	20	31	—	P	P	P	P	9	4	4	4	810 × 100	B	X	1414
14 Dennis	5	28	S	*475*	525	V	84	110	1200	17·9	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	7	14	28	—	P	B	B	B	9	6	4	3	810 × 100 *f*	b, f		
15 Orleans	4	30	S	*475*	525	V	90	100	1000	15·4	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	10	20	30	—	P	P	P	P	9	6½	4	2	810 × 90	Be		
16-20 Metallurgique ...	5	40	S	*475*	525	V	90	110	1300	22·2	*b, m*	*g*	*p*	H	*ex*	S	3	*3rd*	8	20	40	—	B	B	B	B	9	4	—		810 × 90	Be	X	589
14 Heron-Aster ...	5	35	CC	*475*	525	V	84	110	1200	17·9	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	5	14	35	—	P	B	R	P	8	6	4	4	810 × 90	F		
12-16 Wilson-Pilcher ...	4	24	S	*465*	600	H	3¾	3¾	900	14·8	*b*	*g*	*p*	G	*md*	E	4	*4th*	6	10	16	24	P	P	P	P	8	5	4	3	815 × 105 *f*	B	IX	463
18-22 Speedwell ...	5	44	S	*465*	525	V	98	130	1000	24·0	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	11	22	44	—	P	P	B	B	9	6	4	4	815 × 105	F		
18-22 Hurtu	5	45	S	*460*	510	V	88	120	1300	23·0	*b, M*	*g*	*g*	G	*lc*	S	4	*4th*	10	20	35	45	P	P	P	P	8	10	5	3	820 × 120	F		
24 Hallamshire ...	4	35	S	*460*	500	V	105	140	1000	29·5	*b*	*g*	*g*	G	*mc*	S	3	*3rd*	10	21	35	—	P	P	P	P	9	5	4	6	880 × 120	b, f		
18-22 Speedwell ...	5	44	S	*460*	495	V	98	130	1000	24·0	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	11	22	44	—	P	P	B	P	8	9	4	4	815 × 105	F		
16 Mascot	5	35	S	*455*	525	V	88	130	1100	20·6	*b, m*	*g*	*p*	G	*lc*	S	3	*3rd*	9	18	35	—	P	P	B	B	9	8	—		875 × 105	F		
20 Simms Welbeck ...	5	37	S	*450*	625	V	95	110	1000	19·1	*M*	*g*	*g*	G	*lc*	S	3	*3rd*	10	22	37	—	P	P	P	P	10	2	4	5	810 × 90	B	X	704
18-22 West	5	38	S	*450*	550	V	95	130	1100	25·0	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	8	19	38	—	P	B	R	B	8	6	4	4	820 × 90 *f*	b, f		
16-20 **Swift**	4	36	S	*450*	525	V	90	103	1000	16·0	*b*	*g*	*g*	H	*lc*	S	4	*4th*	8	16	26	36	P	P	B	B	8	3	—		875 × 105	B		
16-22 **Dixi**	7	24	S	*450*	510	V	100	100	1000	17·4	*m*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12	24	—	P	B	B	B	9	7	4	5	815 × 105	G	IX	1093
16-20 Mass	5	35	CC	*450*	500	V	98	130	1100	26·4	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	7	15	35	—	P	B	B	P	10	0	—		875 × 105 *f*	F		
12 Clement-Talbot ...	5	44	S	*450*	495	V	85	120	1500	24·9	*b, m*	*f*	*p*	H	*lc*	S	4	*4th*	8	19	30	44	P	P	B	B	8	6	4	7	810 × 90	B		[illegible]
22 Minerva	4	40	S	*445*	485	V	100	115	1200	26·4	*b, m*	*p*	*p*	H	*lc*	S	3	*3rd*	10	25	40	—	P	B	P	F	9	5	4	5	875 × 105 *f*	Be		
20 Simms Welbeck ...	5	37	S	*444*	500	V	95	110	1000	19·0	*M*	*g*	*g*	G	*lc*	S	3	*3rd*	10	22	37	—	P	P	P	P	9	2	4	5	810 × 90	B	X	704
16-20 **Beeston Humber**	5	40	S	*442*	472	V	100	130	900	22·4	*b, m*	*g*	*p*	H	*lc*	S	4	*4th*	10	20	30	40	P	B	B	B	8	10	4	3	815 × 105	B		
16-22 **Dixi**	5	24	S	*435*	495	V	100	100	1000	17·4	*m*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12	24	—	P	B	B	B	9	2	4	5	815 × 105	G	IX	1093
14-16 **Argyll**	7	30	S	*435*	490	V	90	120	1100	21·4	*b*	*g*	*p*	G	*md*	U	3	*3rd*	7	15	30	—	P	B	B	B	9	9	4	1	810 × 90	B	X	1257
12-18 Spyker	5	30	S	*435*	460	V	90	100	1000	15·4	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	8	18	30	—	R	P	B	B	8	6	4	6	810 × 90	H	IX	669
15-20 Horbick	5	35	S	*430*	500	V	90	105	1000	16·4	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	8	18	35	—	P	P	P	P	8	8	—		815 × 105	B		
14-20 **Vinot**	5	35	CC	*430*	490	V	90	130	900	18·3	*b(m)*	*g*	*p*	G	*lc*	S	3	*3rd*	10	20	35	—	P	B	P	P	9	2	4	5	870 × 90	F		
14 **Gladiator**	5	—	S	*430*	—	V	85	120	1000	16·6	*b, m*	*g*	*g*	H	*md*	S	4	*4th*	—	—	—	—	P	P	B	B	9	8	4	3	815 × 105 *f*	F	X	1411
14 **Clement**	5	35	S	*430*	—	V	85	120	950	14·8	*b, m*	*p*	*p*	H	*md*	S	4	*4th*	12	16	25	35	P	B	B	B	9	9	4	3	815 × 105 *f*	F	X	1465
14-16 **Argyll**	5	30	S	*428*	475	V	90	120	1100	20·5	*b*	*g*	*p*	G	*md*	U	3	*3rd*	7	15	30	—	P	B	B	B	8	4	4	1	810 × 90	B	X	1257
12-16 **F.I.A.T.** ...	5	35	CC	*425*	525	V	100	110	800	17·9	*M*	*p*	*g*	G	*md*	S	4	—	6	14	24	35	P	B	B	B	9	4	4	7	880 × 120 *f*	I	X	889
15-20 **Austin**	5	37	S	*425*	500	V	4⅛	5	900	23·9	*b(M)*	*p*	*g*	G	*md*	S	4	—	13	19	27	37	P	B	B	B	9	9	4	7	870 × 120 *f*	B	X	1518
15 **Siddeley**	4	32	S	*425*	500	V	4	4	1000	20·0	*m(b)*	*p*	*g*	G	*lc*	S	3	*3rd*	9	20	32	—	P	B	P	B	9	6	4	3	34 × 3½	B	X	1491
24 Brown	4	40	S	—	500	V	110	120	1200	33·0	*b, m*	*g*	*p*	H	*lc*	S	3	*3rd*	7	17	40	—	P	B	B	B	8	6	4	0	875 × 105	B, be		
18 Star	4	40	CC	*425*	500	V	4	5	1000	25·2	*b*	*g*	*p*	G	*lc*	S	4	*4th*	8	17	32	40	P	B	B	B	9	4	4	4½	34 × 3½	B		
30 Ailsa Craig	6	32	S	*425*	495	V	123	127	950	34·6	*b, m*	*g*	*p*	G	*lc*	S	3	*3rd*	6	15	32	—	P	B	P	P	9	3	4	4	875 × 110	B, be		
16 Chenard-Walcker ...	5	35	S	*425*	485	V	86	130	900	16·5	*b, m*	*g*	*g*	H	*lc*	S	3	*3rd*	8	16	35	—	P	P	P	P	8	7	—		810 × 90	F	IX	81
12-16 Decauville ..	5	20	S	*425*	460	V	90	105	1000	16·4	*m*	*g*	*p*	H	*lc*	S	3	*3rd*	4	18	20	—	P	B	B	B	9	0	4	4	815 × 105	F		
18-20 Vulcan	5	30	S	*425*	450	V	3½	4¾	1000	17·4	*b, m*	*g*	*p*	G	*lc*	S	3	*3rd*	8	16	30	—	P	B	B	B	8	4	4	2	870 × 100	B		
14 **Gladiator**	5	—	S	*425*	—	V	85	120	1000	16·6	*b, m*	*g*	*g*	H	*md*	S	4	*4th*	—	—	—	—	P	P	B	B	8	4	4	3	815 × 105 *f*	F	X	1411
14 **Clement**	4	35	S	*425*	—	V	85	120	950	15·8	*b, m*	*p*	*p*	H	*md*	S	4	*4th*	12	16	25	35	P	B	B	B	8	5	4	3	815 × 105 *f*	F	X	1465
18-20 Scout	5	30	S	*420*	500	V	90	115	1200	21·4	*b, m*	*g*	*p*	G	*lc*	S	4	*4th*	10	16	24	30	P	P	P	P	8	5	4	5	810 × 90	B		
18 Vauxhall	5	35	CC	*420*	475	V	3¾	4½	950	20·6	*b(m)*	*g*	*g*	G	*lc*	S	4	*4th*	7	16	26	35	P	P	P	P	9	2	—		810 × 90	B		
16-20 Scotia	5	35	S	*420*	460	V	3½	4	1500	23·2	*b, m*	*g*	*p*	G	*lc*	S	3	*3rd*	12	24	35	—	P	B	B	B	10	0	4	6	850 × 85	B		
15 Darracq	5	37	S	*416*	449	V	90	120	1000	19·5	*b(M)*	*g*	*p*	G	*lc*	S	3	*3rd*	11	22	37	—	P	B	B	B	7	11	4	4	810 × 90	F		
12-14 Whitlock-Aster ...	5	35	CC	*415*	525	V	84	110	1200	17·9	*b*	*g*	*p*	G	*mc*	S	3	*3rd*	12	25	35	—	B	B	P	P	9	6	4	4	810 × 90	F		
14-16 Speedwell ...	5	40	S	*415*	475	V	85	110	1200	18·2	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	10	20	40	—	P	P	B	B	9	6	4	3	810 × 90	F		
15 Climax	5	28	S	*410*	485	V	84	110	1200	17·9	*b, m*	*g*	*p*	G	*sd*	S	4	*3rd*	8	13	17	28	B	B	B	B	8	8½	4	3	875 × 105	b, f		
20 Hallamshire ...	4	32	S	*410*	475	V	95	130	1000	22·4	*b*	*g*	*g*	G	*mc*	S	3	*3rd*	9	20	32	—	P	P	P	P	9	3	4	6	880 × 120	b, f		
14-16 Speedwell ...	5	40	S	*410*	435	V	85	110	1200	18·2	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	10	20	40	—	P	P	B	P	8	9	4	3	810 × 90	F		
18-22 Iden	5	32	S	*405*	450	V	97	120	1100	23·8	*b(m)*	*g*	*g*	H	*mc*	S	3	*3rd*	10	17	32	—	P	P	B	B	8	3	4	5	810 × 90	B		
14 **Germain**	4	—	S	*400*	515	V	3 7/10	4⅖	1050	19·9	*m*	*g*	*p*	—	*lc*	S	3	*3rd*	—	—	—	—	B	B	B	B	8	8	4	0	810 × 90	Be	X	1464
12-14 Whitlock-Aster ...	2	35	CC	*400*	500	V	84	110	1200	17·9	*b*	*g*	*p*	G	*mc*	S	3	*3rd*	12	25	35	—	B	B	P	P	8	6	4	4	810 × 90	F		
12-14 Sunbeam ...	5	27	CC	*400*	451	V	84	120	800	12·9	*b*	*g*	*p*	H	*lc*	S	4	—	6	13	20	27	P	P	P	P	7	10	4	0	810 × 90	B		
20 **Oldsmobile** ...	5	—	S	—	450	V	4¼	4¾	700	19·0	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	P	P	R	P	8	10	4	4	32 × 3½	A	X	1355
9 Serpollet (steam) ...	5	—	S	—	450	H	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	P	—	P	P	—		—		810 × 90	F		
12-15 **Dixi**	5	28	S	*400*	450	V	95	100	1000	17·2	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	6	12	28	—	P	B	B	B	9	2	4	2	810 × 90	G	X	1093
14 Heron-Aster ...	5	35	S	*400*	450	V	84	110	1200	17·9	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	5	14	35	—	P	B	R	B	8	6	4	4	810 × 90	b, f		

LEADING CHARACTERISTICS.						CONSTRUCTIONAL DETAILS.																										Country of Origin.	Last Described in The Automotor Journal.	
				Price.		Engine.									Transmission.								Bearings.				Dimensions.							
																			Speeds.															
Description.	Seating Capacity.	Geared to (m.p.h.)	Drive.	Chassis.	With Standard Body.	Type.	Bore.	Stroke.	Normal Speed.	Piston Displacement, 10,000 cub. ins. per min	Ignition.	Fuel Feed.	Lubrication.	Control.	Clutch.	Change-speed-gear.	Number.	"Direct."	1st.	2nd.	3rd.	4th.	Engine.	Gear.	Rear Wheels.	Front Wheels.	Wheel Base.		Extreme Width.		Driving Tyres.		Vol.	Page
Four-cylinder Cars—*continued.*																																		
h.p.				£	£		mm. or ins.		r.p.m.										m.p.h.								ft.	ins.	ft.	ins.	mm. or ins			
15 Corre	5	40	S	—	450	V	90	100	1800	27·9	b, m	g	p	G	lc	S	4	4th	8	12	22	40	B	B	B	B	8	4	—		815 × 105	F		
12-14 **Gladiator** ...	5	—	CC	400	—	V	80	120	1200	17·6	b, m	g	g	H	lc	S	4	4th	—	—	—	—	P	P	P	P	9	7	—		810 × 90	F	X	1411
12-14 **Clement**... ...	5	30	S	400	—	V	80	120	990	14·6	b, m	g	g	H	lc	S	4	4th	12	16	22	30	P	P	B	B	6	10¾	4	1½	810 × 90	F		
12-14 Singer	4	32	S	400	450	V	80	90	1600	17·6	b	g	p	H	lc	S	3	3rd	8	16	32	—	P	P	B	B	8	6	4	6	32 × 3½	B		
15-18 **Ariel Simplex**...	5	40	S	395	465	V	3½	3¾	1200	17·3	b	g	p	G	lc	S	4	—	10	20	30	40	P	P	B	P	8	4	4	1½	32 × 3½	B	IX	258
18 Leader	5	51	S	395	450	V	4	6	800	24·8	b	g	p	H	lc	S	3	3rd	12	32	51	—	P	R	R	B	11	0	4	3	34 × 4	B		
20 Gregoire	5	50	S	390	450	V	90	120	1200	22·3	b, m	g	p	H	lc	S	3	3rd	10	20	50	—	P	B	B	B	8	6	4	3½	820 × 120 f	F		
16-20 Pivot	4	25	S	387	485	V	95	110	1000	19·0	b	g	p	G	lc	S	3	3rd	5	15	25	—	P	P	P	P	8	6	4	3	810 × 90	B	X	503
18 Cottereau	5	40	CC	385	460	V	85	105	1200	17·5	m	g	p	G	lc	S	3	3rd	8	20	40	—	P	B	B	B	8	8	4	4½	875 × 105	F		
14 Crawshay-Williams	5	30	CC	385	450	V	90	110	1000	17·1	M	p	p	G	md	S	3	—	9	18	30	—	P	B	B	B	8	11	4	7	880 × 120 f	B		
14-16 Scout	5	28	S	380	450	V	83	115	1200	18·2	b, m	g	g	G	le	S	3	3rd	9	22	28	—	P	P	F	P	8	5	4	5	810 × 90	B		
16 Unic	5	40	S	380	450	V	87	110	110)	17·5	M	g	p	G	lc	S	3	3rd	10	20	40	—	P	B	B	B	8	0	4	3	810 × 90	F		
12-15 **Dixi**	5	28	S	380	425	V	95	100	1000	19·0	b	g	p	G	lc	S	3	3rd	6	12	28	—	P	B	B	B	8	6	4	2	810 × 90	G	X	1093
12 Hallamshire ...	4	27	S	375	450	V	84	110	1200	17·8	b	p	p	G	mc	S	3	3rd	8	17	27	—	P	P	P	P	8	6	4	6	810 × 90	b,f		
15 West	5	34	S	375	450	V	88	130	1200	23·1	b	g	p	G	lc	S	3	3rd	8	17	34	—	P	B	P	P	8	6	4	4	810 × 90	b,f		
10 Renault	5	35	S	372	545	V	76	120	1200	15·9	m	g	p	G	lc	S	3	3rd	8	16	35	—	P	P	B	B	8	7	4	3	810 × 90 f	F		
12 Simms Welbeck ...	5	30	S	371	425	V	82	90	1000	11·6	m	g	g	G	lc	S	3	3rd	10	20	30	—	P	P	P	P	9	2	4	5	810 × 90	B	X	704
20 Bell Bros.	4	30	S	370	450	V	102	127	900	22·8	b, m	p	p	H	md	S	3	—	8	18	30	—	P	B	B	B	9	3	4	1	815 × 105	B		
16-20 Royal Enfield ...	5	35	S	368	420	V	100	125	900	21·5	b	p	g	H	lc	S	3	3rd	8	20	35	—	P	P	B	B	10	0	—		810 × 90	B		
10 Renault	4	35	S	360	510	V	76	120	1200	15·9	m	g	p	G	lc	S	3	3rd	8	16	35	—	P	P	B	B	8	2	4	3	800 × 85	F		
20-22 Brown	4	40	S	—	425	V	100	120	1200	27·3	b, m	g	p	H	lc	S	3	3rd	7	17	40	—	P	B	B	B	8	6	4	0	810 × 90	B,be		
16 Minerva	4	35	S	360	395	V	92	115	1200	22·2	b(m)	g	p	H	lc	S	3	3rd	8	20	35	—	P	B	P	P	9	5	4	5	810 × 90	Be		
14 Climax	4	21	S	350	425	V	3⅛	3½	1600	17·2	b, m	g	p	H	sd	S	4	3rd	6	11	15	21	B	B	B	B	8	8½	4	3	810 × 90	B		
16-20 Rover	4	36	S	350	—	V	95	110	1000	19·1	b(m)	g	g	H	sd	S	3	3rd	12	24	36	—	P	B	B	B	8	3	4	1	810 × 90	B		
12-16 Horbick	5	30	S	350	400	V	80	90	1600	17·6	b	g	p	H	lc	S	3	3rd	9	14	30	—	P	P	P	P	8	0	3	9	760 × 90	B		
16 **Winton**	4	32	S	350	400	V	3½	5	1000	19·1	b	g	p	G	mc	U	2	2nd	—	32	—	—	P	P	R	R	7	4	4	6	30 × 3½	A	X	1461
16 Jackson	4	45	S	350	400	V	90	110	750	12·8	b, m	g	g	G	lc	S	3	3rd	8	16	45	—	P	P	B	B	9	6	4	6	800 × 90	F		
12 Hallamshire ..	4	27	S	350	375	V	84	110	1200	17·9	b	g	g	G	mc	S	3	3rd	8	17	27	—	P	P	P	P	7	11	4	6	810 × 90	b,f		
12-16 **Vinot**	5	28	CC	348	390	V	80	120	900	13·2	b(m)	g	p	G	lc	S	3	3rd	9	17	28	—	P	B	P	P	7	8	4	5	800 × 85	F		
16 Owen Arrow ...	5	40	S	347	432	V	4	4	1000	20·0	b, m	g	p	G	lc	S	4	4th	10	20	30	40	P	B	B	B	9	3	4	6	870 × 90	B		
12-15 Speedwell ..	4	36	S	345	395	V	85	100	1200	16·6	b	g	p	G	lc	S	3	3rd	9	18	36	—	P	P	B	P	8	7	4	3	810 × 90	F		
14 Mass	5	35	CC	340	400	V	85	110	1100	16·7	b	g	p	G	lc	S	3	3rd	7	15	35	—	P	B	B	P	—		—		815 × 105	F		
12-15 Speedwell ...	4	36	S	340	365	V	85	100	1200	16·6	b	g	p	G	lc	S	3	3rd	9	18	36	—	P	P	B	P	8	0	4	3	810 × 90	F		
12-16 Iden	4	27	S	330	370	V	85	95	1100	14·6	b(m)	g	g	H	mc	S	3	3rd	9	18	27	—	P	P	B	B	7	9	4	5	810 × 90	B		
14 Star	4	30	CC	325	375	V	3½	4½	1000	17·3	b	g	p	G	lc	S	3	3rd	7½	16	30	—	P	B	B	B	8	6	4	4½	32 × 3½	B		
18-20 Brown	4	32	S	—	375	V	100	110	1200	23·0	b	g	p	H	lc	S	3	3rd	7	17	32	—	P	B	P	P	8	2	4	0	810 × 90	B,be		
16 Alldays	5	25	S	—	375	V	3¾	4¾	1000	21·0	b	g	g	H	lc	S	3	3rd	7	15	25	—	P	P	P	P	8	6	—		34 × 3¾	B		
12-14 **Swift**	4	30	S	—	372	V	80	90	1650	18·5	b	g	g	H	lc	S	3	3rd	8	17	30	—	P	P	B	B	7	3	—		810 × 90	B	X	251
12-14 Vulcan	5	25	S	325	350	V	3⅛	4¼	1000	13·0	b	g	g	G	lc	S	3	3rd	6	16	25	—	P	P	B	P	7	9	4	2	810 × 90	B		
20 Ailsa Craig	5	32	S	320	395	V	90	110	1200	21·3	b, m	g	g	G	lc	S	3	3rd	6	15	32	—	P	B	P	P	9	3	4	4	810 × 110 f	B,be		
16 Chambers	5	30	C	300	350	H	3⅜	4¼	1000	15·2	b	g	g	G	ex	U	3	3rd	9	19	30	—	P	P	P	P	8	3	4	0	32 × 3¾	B		
20 Stanley (Steam) ...	5	40	G	—	350	H	3⅜	5	—	—	—	-	-	—	—	—	-	—	—	—	—	40	B	—	B	B	8	6	4	6	34 × 3½	A		
12-16 Horbick	4	30	S	300	341	V	80	90	1600	17·6	b	g	p	H	lc	S	3	3rd	9	14	30	—	P	P	P	P	7	0	3	9	760 × 90	B		
18 **Forman**	5	28	S	300	340	V	90	110	1200	21·3	b	g	p	H	lc	S	3	3rd	7	18	28	—	P	B	P	P	8	6	3	10	810 × 90	B,be		
12-14 Rothwell ...	5	27	S	295	360	V	80	90	1250	13·8	b	g	p	H	lc	S	3	3rd	9	16	27	—	P	B	B	B	8	6	4	3	32 × 3½	B		
12 Forman	5	25	S	295	350	V	80	90	1200	13·2	b	g	p	H	lc	S	3	3rd	7	16	25	—	P	B	P	F	8	0	3	7	810 × 90	B,be		

10-12 Coventry Humber	4	28	S	*290*	315	V	3½	3¾	1000	14·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	9	20	28	—	P	P	B	B	8 0	4 0	810×90	B		
12-14 Rothwell	5	27	S	*285*	350	V	80	90	1250	13·8	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	9	16	27	—	P	B	B	B	8 2	4 3	32×3½	B		
16 Chambers	4	30	C	*285*	330	H	3⅜	4¼	1000	15·2	*b*	*g*	*g*	G	*ex*	U	3	*3rd*	9	19	30	—	P	P	P	P	7 6	4 0	30×3½	B		
12 Forman	4	25	S	*280*	300	V	80	90	1200	13·2	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	7	16	25	—	P	B	P	P	7 8	3 7	750×90	B,be		
20 Londonia	5	33	S	*275*	375	V	4	4	1000	20·0	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	11	18	33	—	P	P	P	P	9 3	4 7	34×3½	B		
14 Leader	4	35	S	*275*	350	V	3¼	5	1000	16·6	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	7	15	35	—	P	R	R	B	10 1	4 3	32×3½	B		
14 Leader	2	35	S	*275*	290	V	3¼	5	1000	16·6	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	7	15	35	—	P	R	R	B	8 11	4 3	32×3½	B		
10 Mass...	5	32	S	*270*	300	V	85	100	1200	16·6	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	6	14	32	—	P	B	B	P	—	—	810×90	F		
10-12 Coventry Humber	4	28	S	*270*	290	V	3½	3¾	1000	14·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	9	20	28	—	P	P	B	B	7 1	4 0	760×90	B		
15 Gregoire	4	35	S	*260*	315	V	80	110	1200	16·2	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	8	15	35	—	P	B	B	B	7 8	4 1	32×3½	F		
10-12 Rover	4	30	S	—	300	V	75	100	900	9·6	*b(m)*	*g*	*g*	H	*sd*	S	3	—	10	20	30	—	P	B	B	B	6 9	4 1	750×85	B		
12 Globe	4	28	S,w	*250*	289	V	80	90	1300	14·3	*b*	*g*	*p*	H	*lc*	U	3	—	10	18	28	—	P	B	B	P	8 4	4 0	700×85	B		
16-20 Bell Bros. ...	2-4	27	S	*250*	280	V	90	102	1000	15·8	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	9	18	27	—	P	B	B	B	7 6	4 1	810×90	B		
10 Star	4	27	CC	*230*	260	V	3	4½	1000	12·7	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	8	14	27	—	P	B	B	B	7 6	4 0	30×3½	B		
10 Leader	4	30	S	*205*	280	V	3¼	3½	1000	11·6	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	15	30	—	P	R	R	B	8 8	4 3	30×3½	B		
10 Leader	2	30	S	*205*	225	V	3¼	3½	1000	11·6	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	15	30	—	P	R	R	B	7 6	3 6	30×3	B		
10-12 Pivot	4	25	S	*200*	260	H	75	80	1400	13·8	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	5	12	25	—	P	P	P	P	8 0	4 0	750×85	B	X	503
10 Stanley (Steam) ...	4	30	G	—	220	H	3	4	—	—	—	—	—	—	—	—	—	—	—	—	—	30	B	—	B	B	7 6	4 6	30×3	A		
8 Leader	2	27	S	*180*	195	V	3	3½	1000	9·4	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	—	—	27	—	R	R	R	P	6 11	3 6	28×3	B		
8 Stanley (Steam) ...	4	25	G	—	180	H	3	4	—	—	—	—	—	—	—	—	—	—	—	—	—	25	B	—	B	B	6 6	4 6	30×2½	A		

Three-cylinder Cars.

16 Miesse (Steam) ...	5	40	CC	*550*	640	H	2 5/16	3½	850	—	—	—	—	—	—	—	—	—	—	—	—	—	P	—	P	P	8 0	4 6	32×5	B	VIII	292
16-20 Maudslay ...	5	20	CC	*535*	625	V	4½	4	800	15·2	*b(m)*	*g*	*p*	H	*lc*	S	3	*3rd*	5	12½	20	—	P	P	P	P	8 11	4 5	875×105	B	X	176
18-24 Belsize	4	—	S	*500*	550	V	4⅝	5	850	21·2	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	8	18	30	—	P	P	P	P	8 0	—	820×120	B	X	101
18 National	5	30	S	*475*	575	V	4¼	5¼	900	20·0	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	7	16	30	—	P	P	P	P	10 0	4 6	870×100	B	X	179
18 National	5	30	S	*450*	550	V	4¼	5¼	900	20·0	*b*	*g*	*g*	M	*lc*	S	3	*3rd*	7	16	30	—	P	P	P	P	9 3	4 6	870×100	B	X	179
18 Cottereau	5	40	CC	*425*	500	V	95	120	1200	18·8	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	8	20	40	—	P	B	B	B	9 11	4 4½	875×105	F	IX	58
15-18 Duryea	5	25	C	*420*	500	H	4½	4½	750	16·0	*b*	*g*	*g*	H	*ex*	E	2	*2nd*	8½	25	—	—	P	P	P	P	8 6	4 6	36×3½ *f*	B	IX	39
15-18 Duryea	4	25	C	*415*	485	H	4½	4½	750	16·0	*b*	*g*	*g*	H	*ex*	E	2	*2nd*	8½	25	—	—	P	P	P	P	7 6	4 6	36×3½ *f*	B	IX	39
10 Miesse (Steam) ...	4	35	CC	*387*	430	H	1 15/16	3⅛	1000	—	—	—	—	—	—	—	—	—	—	—	—	—	P	—	P	P	6 10	4 0	32×3	B	VIII	292
18 Cottereau	5	40	CC	*385*	460	V	95	120	1200	18·8	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	8	20	40	—	P	B	B	B	8 5	4 4½	870×90	F	IX	58
18 Cottereau	5	40	CC	*365*	430	V	95	120	1200	18·8	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	8	20	40	—	P	B	B	B	7 7	4 4½	870×90	F	IX	58
15-18 Duryea	2	27½	C	*365*	395	H	4½	4½	750	16·0	*b*	*g*	*g*	H	*ex*	E	2	*2nd*	9½	27½	—	—	P	P	P	P	6 6	4 6	36×3½ *f*	B	IX	39
15 Rykneild	5	35	S	*345*	400	V	4	4½	1000	16·8	*m*	*g*	*p*	H	*lc*	S	3	*3rd*	8	20	35	—	P	P	P	P	8 0	—	810×90	B		
12 Vauxhall	4	25	CC	*330*	375	V	3¾	4½	950	14·0	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	6	14	25	—	P	P	P	P	7 2	4 2	810×90	B		
14 Cottereau	5	30	CC	*325*	390	V	85	105	1200	13·1	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	7½	15	30	—	P	B	B	B	7 7	4 2	810×90	F	IX	58
8-11 Panhard	5	23	CC	*320*	425	V	80	120	900	9·9	*bm*	*g*	*p*	G	*lc*	S	4	—	5	10	16	23	P	P	P	P	8 6	4 6	970×90	F	IX	1047
10-12 Horbick ..	4	28	S	*260*	300	V	80	90	1500	12·1	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	14	28	—	P	P	P	P	6 6	4 7	760×90	B		
12-18 Dougill	4	30	C	*260*	300	V	4⅛	5	1000	19·9	*b*	*g*	*p*	G	—	U	—	—	—	—	—	—	P	B	B	P	8 9	4 3	810×90	B		
12-15 Duryea	2-4	24	C	—	280	H	4½	4½	600	12·8	*b, M*	*g*	*g*	H	*ex*	E	2	*2nd*	6	24	—	—	P	P	P	P	6 6	4 6	36×3½ *f*	A		
9-10 Swift	2	22	S	—	275	V	80	90	1650	13·3	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	8	16	28	—	P	P	B	B	6 6	4 9	30×3¼	B	X	251
9 Vauxhall	2	22	CC	*230*	250	V	3 3/16	4¼	950	9·7	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	6	14	22	—	P	P	P	P	6 8	4 6	700×80	B		

Two-cylinder Cars.

12 Lanchester	5	—	Sw	—	525	H	5¼	5¾	750	18·6	*M*	—	*g*	G	*mc*	E	3	*3rd*	—	—	—	—	P	R	R	B	8 2	4 10	870×90	B	VIII	86
20 Winton	5	32	C	*400*	500	H	5¼	6	1000	25·8	*b*	*g*	*p*	G	*mc*	U	2	*2nd*	—	32	—	—	P	P	R	B	7 10	4 6	880×120	A	IX	1263
12-14 Singer	4	32	C	*388*	420	H	4	6	800	12·4	*b*	*g*	*p*	H	*lc*	E	3	*2&3*	8	16	32	—	P	B	B	B	7 0	4 3	32×3½	B	X	170
12-15 New Arrol-Johnston	7	30	S	*370*	480	H	4¼	6½	800	14·8	*M*	*p*	*p*	G	*md*	S	4	*4th*	6	14	21	30	P	R	R	P	10 3	4 4½	810×90	B	X	1409
16 Albion	5	22	CC	*370*	450	V	4⅞	5	950	17·7	*M*	*g*	*p*	G	*lc*	U	3	*3rd*	6	13	22	—	P	P	P	P	9 3	4 6	34×3½ *f*	B	X	174
16 Albion	5	22	CC	*360*	440	V	4⅞	5	950	17·7	*M*	*g*	*p*	G	*lc*	U	3	*3rd*	6	13	22	—	P	P	P	P	8 9	4 6	34×3½ *f*	B	X	174
12 De Dion	4	30	S	*360*	415	V	100	110	1500	15·6	*b, m*	*g*	*p*	F	*sd*	S	3	—	9	18	30	—	P	P	P	P	8 5½	4 1	810×90	F		
12 James and Browne...	4	26	CC	*360*	400	H	4½	6	600	12·5	*b*	*g*	*g*	G	*mc*	S	4	—	6	13	20	26	P	P	P	P	8 5	4 2	34×3½	B		

LEADING CHARACTERISTICS.						CONSTRUCTIONAL DETAILS.																											Country of Origin.	Last Described in The Automotor Journal.	
				Price.		Engine.									Transmission.								Bearings.				Dimensions.								
																			Speeds.																
Description.	Seating Capacity.	Geared to m.p.h.	Drive.	Chassis.	With Standard Body.	Type.	Bore.	Stroke.	Normal Speed.	Piston Displacement, 10,000 cub.ins. per min.	Ignition.	Fuel Feed.	Lubrication.	Control.	Clutch.	Change-speed-gear.	Number.	"Direct."	1st.	2nd.	3rd.	4th.	Engine.	Gear.	Rear Wheels.	Front Wheels.	Wheel Base.		Extreme Width.		Driving Tyres.			Vol	Page
Two-cylinder Cars—*continued.*																																			
h.p.				£	£		mm. or ins.		r.p.m.										m.p.h.								ft.	ins.	ft.	ins.	mm. or ins.				
12-15 **New Arrol-Johnston**	5	30	S	*350*	410	H	4¼	6½	800	14·8	*M*	*p*	*p*	G	*md*	S	4	*4th*	6	14	21	30	P	R	R	P	8	9	4	4½	810×90		B	X	1409
14 Dennis	4	28	S	*350*	400	V	4⅛	5⅜	1200	17·7	*b*	*p*	*p*	G	*lc*	S	3	*3rd*	6	14	28	—	P	B	B	B	8	6	4	3	810×100 *f*		B, f		
10 Rational	4	—	C	—	400	H	110	120	800	11·1	*b*	*g*	*g*	H	*ba*	E	2	*2nd*	—	—	—	—	P	P	R	R	6	6	4	8	32×2¼		B	IX	1348
14 Heron-Aster ...	5	35	S	*350*	400	V	95	130	1200	13·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	5	14	35	—	P	B	R	P	8	0	4	4	810×90		B, f		
10 Peugeot	5	35	CC	—	395	V	105	105	1350	15·1	*M*	*g*	*p*	G	*lc*	S	4	*4th*	8½	15½	24	35	P	B	B	B	9	4	4	6	810×90		F		
10-12 **Argyll**	7	26	S	*350*	390	V	95	140	1100	13·4	*b*	*g*	*p*	G	*lc*	U	3	*3rd*	6	13	26	—	P	P	R	B	9	0	4	1	810×90		B	X	1257
10-12 **Argyll**	5	26	S	*342*	380	V	95	140	1100	13·4	*b*	*g*	*p*	G	*lc*	U	3	*3rd*	6	13	26	—	P	P	R	B	7	9	4	1	810×90		B	X	1257
16 Albion	5	22	CC	*340*	400	V	4⅞	5	950	17·7	*M*	*g*	*p*	G	*lc*	U	3	*3rd*	6	13	22	—	P	P	P	P	7	0	4	6	34×3½ *f*		B	X	174
12 **Siddeley**	4	27	S	*325*	400	V	4½	4½	900	12·8	*b(m)*	*p*	*g*	G	*lc*	S	3	*3rd*	7	17	27	—	P	B	P	B	9	6	4	3	32×3½		B	X	1420
12 **Wolseley**	5	33	CC	*325*	400	H	4½	5	850	13·6	*b*	*g*	*g*	G	*lc*	S	4	—	9	16	24	33	P	B	B	B	8	6	4	3	32×3½		B	X	1420
12-14 Whitlock-Aster ...	5	35	S	*322*	400	V	95	130	1200	13·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	12	25	35	—	P	B	P	P	7	10	4	4	810×90		F		
10 Clement-Talbot ...	5	36	S	*320*	—	V	100	120	1400	16·1	*b, m*	*g*	*p*	H	*lc*	S	4	*4th*	8	17	26	36	P	P	B	B	8	8	4	7	810×90		B	IX	340
12 **Gladiator**	5	—	S	*320*	395	V	105	140	1000	14·8	*b, m*	*g*	*g*	G	*md*	S	4	*4th*	—	—	—	—	P	P	B	B	9	8	4	2½	810×90		F	X	1411
10-12 Newington ...	5	20	CC	—	375	V	88	140	1200	12·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	7	12	20	—	P	B	P	P	8	6	4	4	810×90		F		
10 Mascot	5	26	S	*315*	370	V	95	140	1100	13·4	*b, m*	*g*	*p*	G	*lc*	S	3	*3rd*	7	14	26	—	P	P	B	B	8	0	—		810×90		F		
10-12 **Argyll**	5	26	S	*315*	350	V	95	140	1100	13·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	6	13	26	—	P	P	R	B	6	3	4	1	810×90		B	X	1257
12 **Gladiator**	5	—	S	*315*	—	V	105	140	1000	14·8	*b, m*	*g*	*g*	G	*md*	S	4	*4th*	—	—	—	—	P	P	B	B	8	4	4	2½	810×90		F	X	1411
10 Renault	5	35	S	*312*	487	V	110	120	1600	22·2	*m*	*g*	*p*	G	*lc*	S	3	*3rd*	8	16	35	—	P	P	B	B	8	7	4	2	810×90 *f*		F		
12-14 Whitlock-Aster ...	2	35	S	*310*	375	V	95	130	1200	13·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	12	25	35	—	P	B	P	P	7	3	4	4	810×90		F		
10 Renault	4	35	S	*309*	450	V	110	120	1600	22·2	*m*	*g*	*p*	G	*lc*	S	3	*3rd*	8	16	35	—	P	P	B	B	8	2	4	2	800×85		F		
12-14 West	5	28	S	*300*	375	V	95	130	1200	13·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	8	16	28	—	P	B	R	B	8	6	4	4	810×90		b, f		
12 Heron-Aster ...	5	30	S	*300*	350	V	88	140	1200	12·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	5	12	30	—	P	P	P	P	7	6	4	4	810×90 *f*		b, f		
10 Unic	5	30	S	*295*	350	V	100	110	1000	10·4	*M*	*g*	*p*	G	*lc*	S	3	*3rd*	8	18	30	—	P	B	B	B	7	10	4	3	800×85		F		
10 Clement-Talbot ...	5	36	S	*295*	340	V	100	120	1400	16·1	*b, m*	*g*	*p*	H	*lc*	S	4	*4th*	8	17	26	36	P	P	B	B	8	2	4	7	810×90		B	IX	340
14 16 **Dixi**	5	20	S	*280*	350	V	110	130	1000	18·0	*b, m*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12	20	—	P	B	B	B	9	2	4	3	815×105		G	IX	1093
10 Unic	2-4	30	S	*280*	300	V	100	110	1000	10·4	*M*	*g*	*p*	G	*lc*	S	3	*3rd*	8	18	30	—	P	B	B	B	6	6	4	3	800×85		F		
10-12 Whitlock-Aster ...	5	30	S	*277*	350	V	88	140	1200	12·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	10	20	30	—	P	B	P	P	7	10	4	4	810×90		F		
10 Hallamshire ..	4	25	S	*275*	300	V	88	140	1200	12·4	*b*	*g*	*g*	G	*mc*	S	3	*3rd*	7	15	25	—	P	P	P	P	7	8	4	6	800×85		b, f		
10-12 Whitlock-Aster ...	2	30	S	*265*	325	V	88	140	1200	12·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	10	20	30	—	P	B	P	P	7	3	4	4	810×90 *f*		F		
10-12 Metallurgique ..	4	35	S	—	330	V	95	110	1300	12·4	*b*	*g*	*p*	H	*ex*	S	3	*3rd*	5	14	35	—	P	B	B	B	8	0	—		750×85		Be	X	589
10-12 Rothwell ...	5	27	S	*260*	325	V	100	120	1000	11·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	9	16	27	—	P	B	B	B	6	6	4	3	32×3½		b, f		
12 Corre	5	36	S	—	325	V	90	110	1200	10·0	*b, m*	*g*	*p*	G	*lc*	S	4	*4th*	10	16	28	36	B	B	B	B	7	2	—		810×90		F		
10 **Gladiator**	5	—	S	*260*	325	V	88	140	1000	10·2	*b*	*g*	*g*	H	*md*	S	3	*3rd*	—	—	—	—	P	P	B	B	8	7	4	1½	810×90		F	X	1411
10 **Clement**	5	27	S	*260*	—	V	88	140	900	9·3	*b*	*g*	*g*	H	*md*	S	3	*3rd*	10	16	27	—	P	B	P	P	8	8	4	3	810×90		F	X	1465
10-12 Hurtu	5	28	S	*260*	330	V	88	120	1300	11·6	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	12	20	28	—	P	P	B	B	6	8	4	9	760×90		F		
10-12 **Belsize**	2	25	S	*260*	275	V	4	4½	850	9·1	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	7	14	25	—	P	P	P	P	6	6	—		700×85		B	X	101
8 **Wolseley**	4	26	CC	*255*	300	H	4	4	900	9·0	*b*	*g*	*g*	H	*lc*	S	4	—	6	12	18	26	P	B	B	B	7	2	4	0	30×3½		B	X	1420
10-12 Rothwell ...	4	27	S	*255*	300	V	100	120	1000	11·5	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	9	16	27	—	P	B	B	B	6	6	4	3	32×3½		b, f		
10 **Gladiator**	5	—	S	*255*	300	V	88	140	1000	10·2	*b*	*g*	*g*	G	*md*	S	3	*3rd*	—	—	—	—	P	P	B	B	7	3	4	1½	810×90		F	X	1411
10 **Clement**	4	27	S	*255*	—	V	88	140	900	9·3	*b*	*g*	*g*	H	*md*	S	3	*3rd*	10	16	27	—	P	B	P	P	7	4	4	3	810×90		F	X	1465
10 West...	4	28	S	*252*	330	V	88	140	1200	12·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	8	16	28	—	P	P	P	P	7	8	4	2½	810×90		b, f		
10 Darracq	5	31	S	*251*	267	V	100	120	1400	16·1	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	9	18	31	—	P	B	B	B	7	1	4	0	760×90		F		
8 Clement-Talbot ...	4	28	S	*250*	275	V	85	110	1400	10·3	*m*	*g*	*p*	G	*lc*	S	3	—	6	15	28	—	P	P	B	B	6	6	3	11	700×85		b, f	IX	340
16 **Maxwell**	5	35	S	—	299	H	5	5	900	17·8	*b*	*g*	*p*	F	*md*	S	3	*3rd*	12	20	35	—	P	P	R	B	7	1	4	8	760×90		A		
12 **Cottereau**	4	26	S	*245*	295	V	95	120	1200	12·5	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6½	13	26	—	P	B	B	B	7	5	4	2	760×90		F	IX	58

8-10 Dixi	5	24	S	*245*	**295**	V	95	100	1000	8·6	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	6	12	14	—	P	B	B	B	8 0	4 2	750×85	G	IX	1093
10-12 Cupelle	4	—	S	*245*	**275**	V	100	120	1200	13·8	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	—	—	—	—	P	P	B	B	9 6	3 9	760×90	F	X	559
12 Oldsmobile ...	4	—	S	—	**260**	V	5	5	700	13·8	*b*	*g*	*p*	H	*lc*	S	3	—	—	—	—	—	P	P	R	P	—	—	—	A	X	1355
9 Speedwell	4	30	S	*235*	**255**	V	85	100	1200	8·3	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	7½	15	30	—	P	P	B	P	6 6	4 0	750×85	F		
8-12 Dougill	4	25	C	*230*	**275**	V	4⅛	5	1000	13·3	*b*	*g*	*p*	G	—	U	—	—	—	—	—	—	P	B	B	P	8 0	4 2	810×90	B		
10 Vulcan	4	25	S	*230*	**250**	V	3½	4¾	1000	9·1	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	8	16	25	—	P	P	P	P	7 0	4 2	750×85	B		
10 Hallamshire ...	2	25	S	*230*	**250**	V	88	140	1200	12·4	*b*	*g*	*g*	G	*mc*	S	3	*3rd*	7	15	25	—	P	P	P	P	6 3	4 6	750×85	b, f		
8 Renault	4-5	28	S	*228*	**310**	V	75	120	1000	6·6	*m*	*g*	*p*	G	*lc*	S	3	*3rd*	6	12	28	—	P	P	B	B	—	4 2	800×85	F		
8-10 Singer	2	30	C	*226*	**241**	H	4	4½	800	9·0	*b*	*g*	*p*	H	*lc*	S	3	*2&3*	8	16	30	—	P	B	B	B	6 2	4 3	30×3	B	X	170
8 James and Browne ...	2	—	C	*225*	**250**	H	3½	4½	800	6·9	*b*	*g*	*g*	G	*mc*	S	3	*3rd*	8	16	24	—	P	P	P	P	6 6	3 6	28×3	B		
9 Cottereau	2-4	25	CC	*215*	**240**	V	85	105	1200	8·7	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12½	25	—	P	P	B	P	6 5	3 8	750×85	F	IX	58
10 Ailsa Craig	2-4	25	S	*205*	**230**	V	90	110	1200	10·0	*b(m)*	*g*	*g*	H	*lc*	S	3	*3rd*	5	12	25	—	P	B	P	P	7 1	4 0	30×3¼	B		
8-10 Scotia	5	28	S	*200*	**240**	V	3½	4	1500	11·6	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	8	16	28	—	P	B	P	B	7 8	4 0	800×85	B		
10 Alldays	4	25	S	*190*	**220**	V	3¾	4½	1200	11·8	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	7	15	25	—	P	P	P	P	6 4½	4 3	28×3¼	B		
8-10 Brown	2-4	28	S	—	**220**	V	90	110	1200	10·0	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	7	17	28	—	P	B	P	P	6 6	4 0	760×90	B, be		
8-10 Bell	2-4	24	S	*190*	**220**	V	90	102	1000	7·8	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	8	16	24	—	P	B	B	B	6 9	4 1	760×85 *f*	B		
9 Jackson	4	35	S	*185*	**210**	V	90	110	750	6·2	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	7	14	35	—	P	P	B	P	—	4 6	28×3½	F		
8 Clyde...	2-5	30	S	*185*	—	V	82	90	1400	8·1	*b*	*g*	*p*	H	*mc*	U	3	*1 2,3*	8	18	30	—	P	B	B	B	6 1	4 4	28×3	B		
8 Chambers	4	21	C	—	**208**	H	3⅜	4½	1000	7·6	*b*	*g*	*g*	H	*ex*	U	3	*3rd*	6	15	21	—	P	P	P	P	6 6	4 0	700×85	B		
7-8 Swift	2	23	S	—	**200**	V	80	90	1200	6·6	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6½	14	23	—	P	P	B	B	6 6	4 3	28×3	B	X	251
8 Gregoire	4	25	S	*180*	**197**	V	80	110	1200	8·1	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12	25	—	P	B	B	B	7 10	3 8½	28×3¼	F		
10 Alldays	2	25	S	*175*	**200**	V	3¾	4½	1200	11·8	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	7	15	25	—	P	P	P	P	6 4½	4 3	28×3¼	B		
8-12 Dougill	4	25	C	*170*	**200**	V	4⅛	5	1000	13·3	*b*	*g*	*p*	G	—	U	--	—	—	—	—	—	P	B	B	P	6 9	4 2	750×85	B		
8 Gregoire	2	25	S	*170*	**185**	V	80	110	1200	8·1	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12	25	—	P	B	B	B	6 3	3 8½	28×3¼	F		
8 Chambers	2	21	C	—	**185**	H	3⅜	4¼	1000	7·6	*b*	*g*	*g*	H	*ex*	U	3	*3rd*	6	15	21	—	P	P	P	P	6 3	4 0	700×85	B		
7 Star	2-3	20	CC	*165*	**175**	V	3½	4½	800	6·9	*b*	*g*	*p*	F	*lc*	S	3	*3rd*	3	13	20	—	P	B	B	B	7 0	4 0	30×3¼	B		
8 Maxwell	2	30	S	—	**173**	H	4	4	900	9·0	*b*	*g*	*p*	F	*md*	E	2	*2nd*	10	30	—	—	P	P	R	B	6 0	4 8	750×80	A		
8 Lindsay	2	30	B	—	**155**	V	3¼	3⅝	1100	7·3	*b*	*g*	*g*	G	*lc*	E	-	—	7½	—	—	30	P	B	B	B	6 4	4 0	28×2½	B		
6 Ailsa Craig	2	24	C	*120*	—	V	75	80	1500	6·3	*b(m)*	*g*	*g*	H	*lc*	S	3	*3rd*	4	12	24	—	P	P	B	B	5 9	3 6	26×2½	B		

One-cylinder Cars.

9 De Dion	2-4	26	S	*270*	**297**	V	110	130	1600	11·9	*b*	*g*	*p*	F	*sd*	S	3	—	8	16	26	—	P	P	P	P	6 10¼	3 10½	750×85	F		
9-11 Berna	4	—	S	*189*	**250**	V	120	130	1000	9·0	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	—	—	—	—	7 6	—	750×85	S		
7-8 Peugeot	4	27	S	—	**250**	V	105	102	1450	7·8	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	8	16	27	—	P	B	B	B	6 8	3 10	750×85	F		
9 Cadillac	4	30	C	—	**245**	H	5	5	1000	9·9	*b*	*g*	*p*	H	*sd*	E	2	*2nd*	8	30	—	—	P	P	R	B	7 6	4 8½	760×90	A	VIII	1105
9-10 Corre	—	30	S	—	**236**	V	110	130	1800	13·4	*b*	*g*	*p*	G	*lc*	S	3	*3rd*	9	18	30	—	B	B	B	B	6 7	—	760×90	F		
8 De Dion	2-4	25	S	*205*	**230**	V	100	120	1600	9·2	*b*	*g*	*p*	F	*ex*	U	3	—	7	15	25	—	P	B	P	P	6 2	3 9	700×85	F		
9 Cadillac	4	30	C	*200*	**231**	H	5	5	1000	9·9	*b*	*g*	*p*	H	*sd*	E	2	*2nd*	8	30	—	—	P	P	R	B	6 4	4 8½	760×90	A	VIII	1105
8 Cottereau	2-4	25	CC	*185*	**210**	V	105	118	1200	7·4	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12½	25	—	P	P	P	B	6 5	3 8	750×85	F	IX	58
8 Darracq	4	25	S	*191*	**207**	V	112	130	1400	10·9	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12	25	—	P	B	B	B	7 1	4 0	700×85	F		
9 Jackson	4	33	S	*185*	**210**	V	106	120	1200	7·6	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	7	12	33	—	P	P	B	B	6 6	—	28×3½	F		
6 Speedwell	2	25	S	*180*	**195**	V	90	110	1500	6·4	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	6	12½	25	—	P	P	B	P	6 6	3 9	700×85	F		
9 Cadillac	2	35	C	*180*	**183**	H	5	5	1000	9·9	*b*	*g*	*p*	H	*sd*	E	2	*2nd*	9	35	—	—	P	P	R	B	6 4	4 8½	750×85	A	VIII	1105
9-10 Adams Hewitt ...	3	25	C	*175*	**185**	H	4¾	6	1000	10·6	*b(M)*	*g*	*p*	H	*ba*	E	2	*2nd*	10	25	—	—	P	P	R	R	6 8	4 2	30×3½	B		
8 Mass	4	25	S	*170*	**185**	V	100	120	1600	9·2	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	5	12	25	—	P	P	P	P	6 8	4 0	700×85	F		
9 Hurtu...	4	20	S	*160*	**200**	V	110	120	1300	9·0	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	8	12	20	—	P	P	B	B	6 0	—	750×85	F		
8 Rover...	2	22	S	—	**200**	V	114	130	900	8·2	*b(m)*	*g*	*g*	H	*sd*	S	3	—	7	14	22	—	P	B	B	B	6 6	4 0	750×85	B		
6 Wolseley	2	20	C	*160*	**175**	H	4½	5	800	6·4	*b*	*g*	*g*	H	*lc*	S	3	—	7	13	20	—	P	B	B	B	5 6	4 0	28×3¼	B	X	1420
8 Cottereau	2	30	S	*165*	**185**	V	105	118	1200	7·4	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	7½	15	30	—	P	P	B	B	5 9	3 8	750×85	F	IX	58
8 Alldays	2	25	S	—	**180**	V	4½	4½	1250	9·0	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	7	15	25	—	P	P	P	P	6 0	4 3	28×3¼	B		
7 Dougill	4	20	C	*154*	**171**	V	4⅛	5	1000	6·6	*b*	*g*	*p*	G	—	U	—	—	—	—	—	—	P	B	B	P	6 6	3 10	750×85	B		
7-9 Dixi	2-3	20	S	*150*	**175**	V	110	130	1000	7·4	*b*	*g*	*p*	G	*lc*	S	2	*2nd*	6	20	—	—	P	B	B	B	6 1	4 0	700×75	G	IX	1093
6½ Peugeot	2	25	S	—	**175**	V	94	94	1350	5·2	*b*	*g*	*g*	G	*lc*	S	3	*3rd*	4	11	25	—	P	B	B	B	5 6	3 6	700×75 *f*	F	IX	513
6 Jackson	4	30	S	*145*	**160**	V	90	110	1200	5·0	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12	30	—	P	P	B	B	6 0	4 3	28×3½	F		
9 Globe...	2-4	25	Sw	—	**160**	V	4½	5	1000	7·9	*b*	*g*	*g*	H	*lc*	U	3	*3rd*	8	16	25	—	P	P	B	P	6 6	4 0	700×85	B		
8-9 Newmobile ...	4	28	S	*135*	**160**	V	100	120	1500	8·6	*b*	*g*	*g*	G	*dc*	U	2	*2nd*	10	28	—	—	P	P	B	B	7 6	4 2	700×85	B, f		
7 Oldsmobile	2	20	C	—	**150**	H	5	6	700	8·3	*b*	*g*	*g*	H	*sd*	E	2	*2nd*	7	20	—	—	P	P	R	B	5 6	—	28×3	A	VIII	820
6-8 Cupelle	2	—	S	*135*	**150**	V	100	120	1200	6·9	*b*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	P	P	B	B	6 0	3 6	700×85	F	X	559
7 Dougill	2	20	C	*133*	**147**	V	4⅛	5	1000	6·6	*b*	*g*	*p*	G	—	U	-	—	—	—	—	—	P	B	B	P	6 0	3 10	700×85	B	—	

LEADING CHARACTERISTICS.						CONSTRUCTIONAL DETAILS.																											Last Described in The Automotor Journal.	
				Price.		Engine.									Transmission.								Bearings.				Dimensions.							
																	Speeds.																	
Description.	Seating Capacity.	Geared to m.p.h.	Drive.	Chassis.	With Standard Body.	Type.	Bore.	Stroke.	Normal Speed.	Piston Displacement, 10,000 cub.ins. per min.	Ignition.	Fuel Feed.	Lubrication.	Control.	Clutch.	Change-speed-gear.	Number.	"Direct."	1st	2nd	3rd	4th	Engine.	Gear.	Rear Wheels.	Front Wheels	Wheel Base.		Extreme Width.		Driving Tyres.	Country of Origin.	Vol	Page
One-cylinder Cars—*continued.*																																		
h.p.				£	£		mm. or ins.		r.p.m.										m.p.h.								ft.	ins.	ft.	ins.	mm. or ins.			
8-9 Newmobile... ..	2	28	S	*130*	150	V	100	120	1500	8·6	*b*	*g*	*g*	G	*dc*	U	2	*2nd*	10	28	—	—	P	P	B	B	6	6	4	2	700 × 85	B, f		
6 Newmobile	2	20	S	*118*	133	V	90	110	1500	6·2	*b*	*g*	*g*	G	*dc*	U	2	*2nd*	7	20	—	—	P	P	B	B	6	6	4	2	700 × 85	B, f		
4½ Jackson	3	26	S	*110*	125	V	84	90	1200	3·6	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	6	12	26	—	P	P	B	B	5	3	4	3	26 × 2½	F		
6 Starling	2	22	C	*100*	110	V	4	4½	1000	5·6	*b*	*g*	*p*	H	*lc*	S	3	*3rd*	8	14	22	—	P	P	B	B	6	0	3	7	700 × 80	B		
6 Rover...	2	24	S	—	105	V	95	100	900	3·8	*b*	*g*	*g*	H	*sd*	S	3	—	8	16	24	—	P	B	B	B	6	0	4	0	700 × 65	B		

Leading Characteristics—
Drive.—S = Propeller Shaft; Sw = Propeller Shaft with worm drive; C = Single Chain; CC = Side Chains.
Engine—
Type.—D = Diagonal; V = Vertical; H = Horizontal.
Cylinder Capacity. — The figures in this column would denote the powers of the engines if 5,000 cubic inches suction = 1 h.p.
Ignition.—*b* = Battery; *m* = H.T. Magneto; *M* = Low-tension magneto. Brackets round either of these letters denote "fitted, as an extra, when required."
Fuel Feed.—*p* = Pressure; *g* = Gravity.
Lubrication.—*p* = Pressure Feed from lubricator to engine; *g* = Gravity Feed ditto.
Control.—G = Automatic Governor; H = Hand Control; F = Foot Control.
Transmission—
Clutch.—*lc* = Leather Faced Cone; *mc* = Metal Cone; *md* = Multiple Disc; *sd* = Single Disc; *ex* = Expanding; *sc* = Scroll; *dc* = Double Cone (leather and metal); *hy* = Hydraulic; *ba* = Band.
Change Speed Gear.—S = Sliding Spur; E = Epicyclic; U = Unusual.
Bearings—
P = Plain; B = Ball; R = Roller.
Dimensions—
Tyres.—*f* denotes that the front wheels are of different size.
Country of Origin—
B = Great Britain; F = France; Be = Belgium; G = Germany; I = Italy; S = Switzerland; H = Holland; A = United States; B, f = British Engine, French Chassis; B, be = British Engine, Belgian Chassis; b, f = British Chassis, French Engine.

The AUTOMOTOR JOURNAL BUYERS' GUIDE.

COMPARATIVELY little need be said by way of explanation concerning the various columns of figures and other data that constitute the comprehensive table of this year's cars that we publish to-day, especially in view of the fact that it has been compiled by us on practically identical lines to the "Buyers' Guide," which we issued in connection with the vehicles exhibited at the last Olympia Exhibition. It, of course, contains, however, particulars of a far greater number of cars than our previous table of pleasure vehicles, for that guide referred exclusively to the exhibits at the Show, whereas on the present occasion the tables contain practically every type of touring or town carriage that is now on the market in this country.

Primarily, as before, the cars are grouped together according to the number of single-acting (or equivalent double-acting) cylinders, while in each of these categories they are arranged in order of price, either by taking the price of the chassis or in certain cases that of the complete vehicle. Steam cars are in this manner placed amongst the numerous petrol cars; although the piston of a single-acting steam-engine receives an impulse *every* revolution instead of each *alternate* revolution—as with an ordinary petrol engine—this fact is neglected, and it is only a double-acting cylinder that has been taken as being equivalent to two cylinders of a petrol engine.

A glance at the headings of the various columns will show the prospective purchaser that the chief essential particulars are given at the left-hand side of the tables, under a special sub-heading. Here he can ascertain, without reference to any of the final foot-notes, the power, the normal top speed, the seating capacity and the price of each vehicle, while in a further column, also covered by the same sub-heading, are symbolic letters (explained in the footnotes) indicating whether the car has side-chains, a propeller-shaft, or other type of driving mechanism.

To the right of this more general information, are a large number of columns, in connection with some of which it is necessary to refer to the footnotes that are given at the end of the tables. These columns afford, in a condensed form, a practically complete specification of the car in question, including data concerning the type of mechanism employed, the dimensions of all parts that are of importance from that point of view, and such details as lubrication and ignition.

The chief novelties that have been introduced by us on this occasion are the final columns on the right-hand side of the tables, for in one of these we have been able, for the first time, to denote the country of origin of each vehicle, and in the other columns we have drawn attention—by giving a reference to volume and page—to the latest description that has appeared of each of the best-known cars in the back numbers of THE AUTOMOTOR JOURNAL.

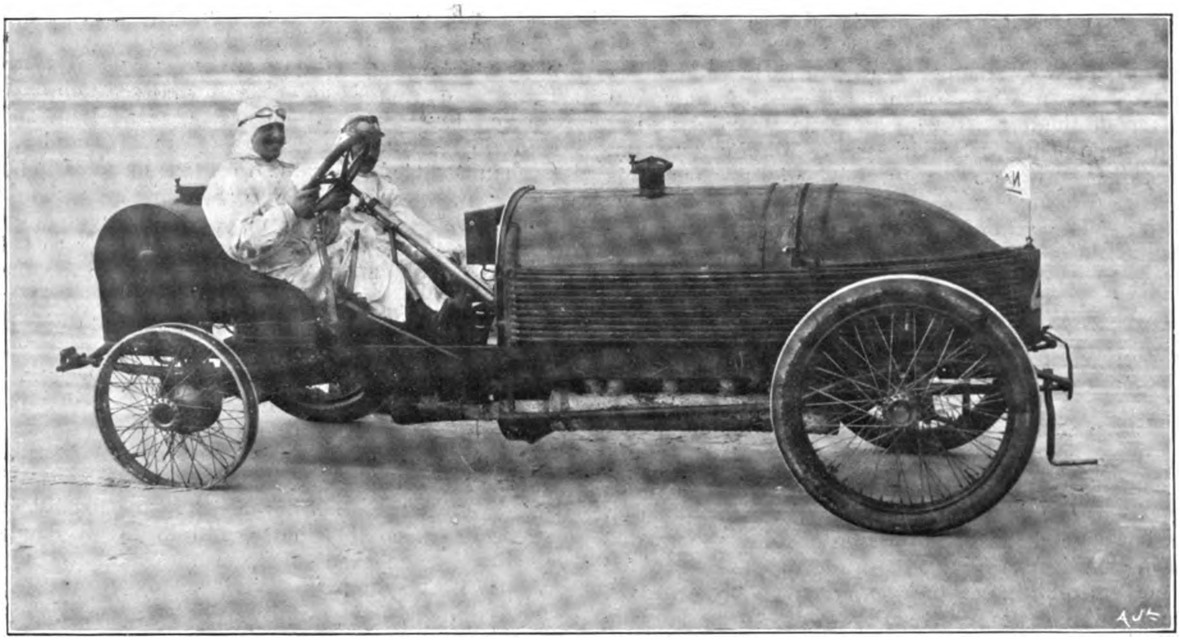
One useful piece of information is alone missing, so far as we are aware, from the Buyers' Guide, but this is of a character which we, as far as possible, avoid giving in our editorial pages, on principle. We refer, of course, to the absence of any of the addresses of the firms who manufacture or sell the vehicles in question. We are well aware that prospective purchasers desire to know where they can apply for further particulars of the cars they fancy, and where they can write when placing their orders, but we still adhere to what a few may think to be our old-fashioned views on this subject, and maintain, in spite of all "modern methods" of up-to-date *journalism* (save the mark), that the only proper place for announcements of this kind, is in the advertisement columns.

We have, however, in this special case, met the difficulty to some extent, and have adopted a system by which buyers using our guide can ascertain at a glance whether or not it will save their time to turn to the advertisement columns of this journal for this and other information. For this purpose, in the first column, the **names of all the cars** which are sold by firms who regularly insert business announcements in our pages, are printed in a thicker black type, while, in addition, we append below a supplemental list in which those particular vehicles are arranged in alphabetical order. In this list, moreover, we give the names of the firms in question, and we also devote a special column in which the leading characteristics of each make of car are briefly summarised.

Description.	Manufacturer or Agent.	Leading Features.
Ariel-Simplex, 35–40-h.p. ... ,, 20–25-h.p. ,, 15–18-h.p.	Ariel Motor Co. ... ... ,, ,, ,, ,,	One 6-cyl. and two 4-cyl. models, of the live-axle type, with "Mercedes" gear-boxes, and with the road wheels mounted outside the axle tubes. Metal-to-metal or leather cone clutches as required.
Argyll, 26–30-h.p. ... ... ,, 16–20.h.p. ,, 14–16-h.p. ,, 10–12-h.p.	Argylls, London ... ... ,, ,, ,,	All except the smallest model have Hele-Shaw multiple disc clutches. The change-speed-gear has its "second" and "third" speed gear-wheels always in mesh, the "first" speed only being of the sliding type. The pressed steel frame has a ∩-shaped section, and the standard bodies have pressed steel panels.
Arrol-Johnston, 24–30-h.p. ... ,, 12–15-h.p.	New Arrol-Johnston Co. ... ... ,, ,,	Both models are of the live-axle type, the smaller with a specially balanced 2-cyl. horizontal engine, and the latter with a 4-cyl. vertical engine. Both are fitted with a "spring-drive" device.
Austin, 25–30-h.p. ... ... ,, 15–20-h.p.	Austin Motor Co. ... ... ,, ,,	Quite new 4-cyl. British vehicles, the larger being fitted with live axle or with side chains as required, but the smaller having a live axle invariably. Engines have high-speed governors, and means for synchronising the igniters and valves whilst running. Disc clutches an d "Mercedes" type change-speed-gear.
Belsize, 30–40-h.p. ... ... ,, 24–30-h.p. ,, 18–24 and 10–12-h.p.	Belsize Co. ... ... ,, ,,	Engines with 2, 3, 4, and 6 cyls. Larger cars fitted with Hele-Shaw clutches instead of leather-faced cone clutches. All models have shaft-driven live axles and Panhard gear-boxes.
Berliet, 60-h.p. ... ... ,, 40 and 22-h.p.	J. E. Hutton ... ... ,,	A French make of car, similar in design to the "Mercedes" vehicles, except that the clutch is of the expanding metal-to-metal type.
Berna, 9–11-h.p.	Straker and MacConnell	A Swiss light car of live-axle type, with single-cyl. slow-speed engine.
Bianchi, 24–40-h.p. ... ... ,, 16–22-h.p.	Straker and MacConnell ... ... ,, ,,	Italian cars of the chain-driven type, with 4-cyl. engines and "Mercedes" type gear-boxes.
Brooke, 35-h.p. ... ... ,, 28 and 15–20-h.p.	J. W. Brooke and Co. ... ... ,, ,,	Both 4-cyl. models are chain driven, but the 6-cyl. car—which is quite a new model—has a shaft-driven live axle.
Cadillac, 9-h.p.	Anglo-American Motor Car Co. ...	A substantial American light car, with a single-chain drive from the horizontal engine and epicyclic change-speed-gear to the live axle.
Clement, 30, 24, 18-h.p. ... ,, 14, 12, 10-h.p.	Clement Motor Co.... ... ... ,, ,,	The differential countershaft casing on the 24 and 30-h.p. models is quite distinct from the change-speed-gear box, so that the general arrangement of engine and gear is similar on all cars. Multiple-disc clutches and gear boxes of the "Mercedes" type are, however, fitted to the larger models.
Crossley, 40-h.p. ... ... ,, 22-h.p.	Chas. Jarrott and Letts ... ... ,, ,,	Powerful chain-driven touring cars having 4-cyl. engines of British construction, fitted with "Xenia" carburettors. Expanding metal-to-metal clutches are used, and the steering gear has special features.
Cupelle, 18-h.p. ... ... ,, 10–12 and 6–8-h.p.	Cupelle Motors ... ... ,,	Light French touring cars, having live axles, and "Panhard" type gear boxes, 1, 2, and 4-cyl. models.
Daimler, 35-h.p. ... ... ,, 30-h.p. ,, 28-h.p.	Daimler Motor Co.... ... ... ,, ,, ,, ,,	Large, powerful 4-cyl. vehicles of the chain-driven type. Armoured wood frame, and the gear-box of special design, although operating on the Mercedes principle. Throttle and ignition controlled by a single hand lever above the steering wheel.
De Dietrich, 60, 40–50-h.p.... 24–30, 16–20, 12–15-h.p.	Chas. Jarrott and Letts ... ... ,, ,,	All models similar in general design, with 4-cyl. engines and side-chain drive. Specially-designed clutches of the leather cone type.
De Dion, 24-h.p. ... .. ,, 15-h.p. ,, 12-h.p. ,, 9-h.p. ,, 8-h.p.	De Dion-Bouton ... ... ,, ,, ,, ,, ,, ,, ,, ,,	All have cardan shafts to drive the road wheels, which are mounted on a stationary axle. Except on the smallest model, which has individual clutch in the gear-box, the change-speed mechanism is of the sliding spur-wheel type, and the main clutch is of the single disc pattern.
Delaunay Belleville, 40-50-h.p. ,, 28–32-h.p. ,, 20–24, 16–20-h.p.	Burlington Carriage Co. ... ... ,, ,, ,, ,,	Four-cylinder French cars of very substantial design in all respects. Those of higher power are chain-driven, but the small model is also made with a live axle.

Description.	Manufacturer or Agent.	Leading Features.
F.I.A.T., 24-40-h.p. ... „ 16–24 „ 12–16	Fiat Motors ... ... „ „	Chain-driven Italian cars similar in design to the German Mercedes, but with multiple disc clutches. All have 4-cyl. engines, including the 12–16-h.p. model introduced for the first time this year.
Germain, 35-h.p. ... ... „ 24-h.p. ... ... „ 16 and 14-h.p.	Capt. Theo. Masui ... ... „ „ „ „	On the larger models side-chains are used, but the entirely new 14-h.p. car has a live-axle. All the engines have four separate steel cylinders with brass water-jackets.
Gladiator, 30, 24, 18-h.p. ... „ 14, 12–14-h.p. „ 12, 10-h.p.	Gladiator Co. ... ... „ „	The larger 4-cyl. cars and the 6-cyl. model have multiple-disc clutches. Some are chain-driven, the chains being enclosed, others have live-axles. A feature of the suspension is the use of ¾ elliptic side-springs at the rear.
Humber, 16–20-h.p. ... ... „ 10–12-h.p.	Humber, Ltd. ... ... „	British cars of the live-axle type, with 4-cyl. engines. The rear wheels run on tubular extensions of the axle-casing, and the casing has a horizontal joint that facilitates thorough inspection.
Iris, 35–40-h.p. ... ... „ 25–30-h.p.	Legros and Knowles ... ... „ „	British vehicles with 4-cyl. engines. A special form of universal-joint is fitted to the propeller-shaft, the live-axle casing enables the differential-gear to be bodily removed without disturbing the axle. The throttle and the ignition are controlled by a single lever, and a dynamo automatically recharges the accumulators.
Maudslay, 30–40-h.p. ... „ 20–30-h.p. „ 16–20-h.p.	Maudslay Motor Co. ... ... „ „ „ „	The smallest of these chain-driven cars has a 3-cyl. engine, the largest is either fitted with a 4 or a 6-cyl. engine. All the engines have the cam-shaft arranged over the cylinders in such a way that it can be hinged back to facilitate the removal of the valves from above the cylinder-heads.
Mercedes, 70, 45-h.p. ... „ 35, 20–25-h.p.	Du Cros Mercedes ... ... „	These famous German Daimler cars are all of high power. They are chain-driven, have 4-cyl. engines, and are fitted with scroll clutches.
Napier, 60-h.p. ... ... „ 45-h.p. „ 40-h.p. „ 18-h.p.	S. F. Edge ... ... „ „ „	The 60 and 40-h.p. are 6-cyl. cars, the larger having a live-axle, and the 40-h.p. model being made either of that type or with side-chains. Metal-to-metal cone-clutches are fitted, except on the smallest vehicle, which is either built as a touring car or as a special landaulette of the "mock electric" pattern.
Oldsmobile, 20-h.p. ... ... „ 12-h.p. „ 7-h.p.	Chas. Jarrott and Letts ... ... „ „ „ „	The two higher-powered models are of recent introduction, designed on European lines, with vertical engines, sliding spur-wheel gears, cone clutches, and live axles. The smallest is a popular "runabout," with a single-chain drive to the rear axle, a horizontal engine, and epicyclic gear.
Panhard, 50, 35-h.p. ... „ 24, 15-h.p. „ 8–11-h.p.	J. E. Hutton ... ... „ „	The 8–11-h.p. is a 3-cyl. chassis, but otherwise all these chain-driven vehicles have 4-cyl. engines. Disc clutches are employed on the larger models. High-tension magnetos are fitted to all engines.
Regent, 18-h.p.	S. F. Edge	A medium-powered vehicle of German construction, built on orthodox lines, with 4-cyl. engine, Panhard type gear, and live axle.
Rolls-Royce, 30-h.p.... ... „ 20-h.p.	C. S. Rolls and Co. ... ... „ „	The largest is a 6-cyl. vehicle, and there are two distinct types having engines of 20 h.p., one being a 4-cyl. touring car, and the other a special 8-cyl. town vehicle. All are of the live-axle type.
Siddeley, 70, 32-h.p. ... „ 25, 18-h.p. „ 15, 12-h.p.	Wolseley Motor Car Co. ... ... „ „ „ „	These cars are made by the Wolseley Company and have vertical engines with either 4 or 2 cyls. Some have live axles and some are chain-driven; the latter have the differential counter-shaft casing separate from the gear-box.
Swift, 16–20, 12–14-h.p. ... „ 9–10, 7–8-h.p.	Swift Motor Co. ... ... „ „	Live-axle cars of moderate and medium power, fitted with 4, 3, and twin-cylinder engines, which are also of British manufacture.
Thornycroft, 36-h.p.... ... „ 24-h.p. „ 14-h.p.	J. I. Thornycroft and Co. ... ... „ „ „ „	All are of the live-axle type with multiple-disc clutches. The two smaller have 4-cyl. engines, but the larger is a 6-cyl. car only just introduced. On the smallest engine, the valves are all arranged above the cylinder heads.
Vinot, 35–50-h.p. ... ... „ 30–45-h.p. „ 20–30-h.p. „ 14–20 and 12–16-h.p.	T. J. Harman and Co. ... ... „ „ „ „ „ „	Chain-driven cars, all of which have 4-cyl. engines, except the most powerful, which has a 6-cyl. engine. The change-speed-gear is operated by a special type of mechanism, and some models have ¾ elliptic side-springs at the rear.
White, 18-h.p. ... ... „ 15-h.p.	White Steam Cars ... ... „ „	One of the very few thoroughly satisfactory types of pleasure vehicle propelled by steam. The more powerful new model enables any form of side entrance body to be employed, whereas previously all bodies were of the tonneau pattern.
Wolseley, 12-h.p ... ... „ 8-h.p. „ 6-h.p.	Wolseley Motor Car Co. ... ... „ „ „ „	Cars of moderate power, with horizontal, slow-speed engines. The two larger have twin-cylinder engines and side-chains; the smallest has a single-cylinder engine and a central-chain drive. A Renold silent chain transmits the power from the engine to the gear-box.

RACES, RECORDS, AND TRIALS.



ORMONDE-DAYTONA BEACH RACES.—In the issue of the "Automotor Journal" for February 3rd, we gave the chief results of this Florida Race Meeting, at which so many world's records were secured. Amongst these was the 100 miles, by Clifford Earp on his 6-cylinder Napier, in 75 mins. 40⅗ secs., which time was accomplished in spite of Earp having to run with three tyres only from the 35th mile onward. Our photograph shows Earp and his car immediately after the finish, none the worse for the gruelling he had experienced.

Unofficial Motor Trials.

We are officially informed that the Automobile Club, having in view the best interests of the public, and possessing an effective organisation for the express purpose of observing and reporting upon the actual performance of any car, is now taking definite action, in conjunction with the trade, to discourage unofficial trials, by preventing all cars taking part in such unofficial trials from entering or in any way taking part in any competition organised by or held under the auspices of the club, *e.g.*, like the International Tourist Trophy Race. At the same time the club is thoroughly investigating the question of cost to the entrant for an official trial, with a view to reducing the fees, if possible, now charged for officially observing and granting a certificate for a long-distance trial. The club desires to point out very strongly to the prospective motor buyer that its certificate of performance is a simple and accurate *record*, and in no way comments upon the performance of the car. A further point to be noted is that at the end of each day's run the car is delivered into the charge of the club officials, who thus have it under observation continuously.

Scottish Reliability Trial, June 13th–16th.

As a number of entries have already been offered, we have been asked to state that no entries whatever will be received except on the official forms, and these are not yet available. These forms will be issued to manufacturers and others, along with the rules and conditions, very shortly, and if any firms wish to ensure that their names are on the list, they should communicate with Mr. R. J. Smith, the honorary secretary of the Scottish Automobile Club (Western Section) at once.

Automobile Club Trials.

The following is a list of entries for the various trials received up to noon on Monday.

Tyres.

Collier Tyre Co., two sets; experimental set, entered through the Collier Tyre Co.; Hartridge Tyre Syndicate, solid rubber block tyres fitted to a 'bus chassis.

Cars.

24-h.p. Dennis.

Speedometers.

"Vulcan" (Geipel and Lange), Staunton and Co., Elliott Bros., "Jones" (S. F. Edge, Ltd.), "Gratze" (S. F. Edge, Ltd.), experimental (R. B. Kirby), Cowey Engineering Co., Ltd., "Werner" (Selig Sonnenthal and Co).

Lamps.

Tail lamps—Ryta and Hoult Trading Co., The Metallic Mirrors, Ltd., Worsnop and Co.

Head lights—Gas, Worsnop and Co.; paraffin, George Polkey, Ltd.

To Climb Frome's Hill.

Competitors in the Hereford small car trials will recollect the severe test which climbing Frome's Hill inflicted upon many of the low-powered cars. The Herefordshire A.C. have now decided to hold an open competition for cars on this hill, probably in May next.

The Grand Prix.

It seems fairly certain now that this French race will be run on June 26th and 27th, and that the entrance fee will be 5,000 francs per car.

Starting for the second day's race will be arranged so as to practically make this a *continuation* of the first day, by starting each car at the same intervals of time which existed between them respectively when they finished the day's racing on the first day. In the event of any car being 3 hours to the bad behind the best car on the first day, the driver will not be allowed to start on the second day.

Los Angeles to San Diego.

ALL-ROUND success attended the first endurance run between Los Angeles and San Diego on January 25th and 26th. The distance was 180 miles, spread over two days, a halt being arranged at Elsinore, 80 miles out, on the first night. Rough roads and big mountain climbs made the test a severe one, the second day's run to San Diego being particularly trying in hill negotiation. Three ridges had to be surmounted, and a few accidents from over-speeding were recorded, but nothing of serious moment. The sensation of the meeting was the performance of the White steam cars, one of which, driven by C. A. Hawkins, of San Francisco, secured the Cup in the big touring car class, beating G. F. Belden's 1906 Packard by nearly three gallons of fuel—both cars scoring the full 1,000 marks. In the light touring car class the Cup was awarded to a 1905 model Ford car, which lost only one mark, the Gasoline and Economy Prize Cup going to F. A. Bennett's car of the same make. R. C. Hamlin's Franklin car was first in the runabout class, losing 25 marks on account of hills and tyres. The Maxwell cars were high up in the running, but were disqualified for transgressing the regulations in regard to carrying advertising signs. Four White steamers, in addition to the winner in the big car class, three of which were driven by private owners, were awarded first-class certificates, losing one, two, and three points only respectively.

Anti-skid Competition Abandoned.

IT has been decided by the A.C. Seine-et-Oise *not* to hold their anti-skid device competition this year, in consequence, it is stated, of the deposit of 500 francs required by the A.C. de France towards the expenses of the Annal "Calendrier," before official recognition of the event can be accorded. We recently drew attention to this new idea of the French Club.

Havana Race Meeting.

SEVERAL of the Continental drivers took part in the Havana meeting which commenced on Monday last, when the main attraction was a race over a distance of $217\frac{1}{2}$ miles. A road measuring 54·37 miles between Havana and San Cristobal was selected, which had to be covered four times. Four started, viz., Lancia (Fiat), Cedrino (Fiat), Demogeot (Darracq), and Bernin (Renault). Cedrino came to grief in rounding a bad corner and had to give up; Lancia's mechanic was thrown from the car and broke his leg, Lancia himself subsequently abandoning the race in order to help his companion, Cedrino. Bernin, who led in the first lap, covered the 54·37 miles in 51 minutes. Demogeot lost eight minutes at the start, but made up five of this on the first round, his time being 54 mins. 26 secs., against Bernin's 51 mins. 4 secs. On the second round he took first place with 1h. 45m. 32s., against Bernin's 1h. 53m. 44s., and maintained his speed until the finish, securing the race with his 200-h.p. Darracq in 3h. 38m. $18\frac{4}{5}$s. The arrangements for the race were in the hands of the Cuban Government, who had told off 550 soldiers to keep the course, and President Palma personally attended the races, accompanied by the members of his Cabinet.

A Spanish Motor Run.

IN honour of the marriage of the King of Spain with Princess Ena, in June, the leading Spanish automobilists propose organising a motor run between Barcelona, Saragossa, and Madrid, a distance of about 650 kiloms.

Nice Meeting.

AUTHORISATION has been given for the motor speed events to take place at Nice next month. In addition to the mile and kilometre, there will also be a hill climb of about 9 kiloms. on the Turbie road.

MOTOR CYCLING.

Land's End to John-o'-Groats.—This event of the Auto Cycle Club bids fair to be one of the most interesting trials ever promoted for motor cycles, and already entries are being received from those manufacturers desirous of taking part in same. It has been suggested that it would be desirable to place a limit on the number of entrants, and those who intend entering will do well to consider the advisability of sending in their names at the earliest possible moment, as this not only guards against their being shut out of the trial, but it considerably facilitates the organisation, which, in such a trial as this, is no small matter. Manufacturers, and also private owners, who intend entering should therefore communicate with the Secretary, Auto Cycle Club, 18, Down Street, Piccadilly, W., as early as possible.

Motor Cycling Club.

THE following is the programme of special events for 1906:—

March 31st.—Opening run to Brighton.

April 13th.—Easter tour to Yeovil.

May 5th.—Two hill-climbing competitions (motor cycles only), run as separate events, one confined to private owners.

May 19th.—Brown 50-guinea Challenge Cup for cars the private property of member driving.

June 1.—London to Edinburgh 24-hours' run, open to cars and motor cycles.

June 23rd.—100 miles non-stop trial for motor cycles, private owners only.

July 7th.—200 miles non-stop trial for motor cycles, private owners only.

July 28th.—Reeves Challenge Cup, 200 miles reliability trial for motor bicycles.

August 25th.—International team competition for motor cycle Challenge Cup.

Sept. 15th.—Passenger trial competition, motor cycles only.

,, 29th.—Motor cycle petrol consumption trial.

River Hill Open Event.

OF the 35 motor bicycles and tricars entered for the Lewisham A.C.'s open hill climb on River Hill, Sevenoaks, last Saturday, mainly owing to the very bad weather conditions, only 17 actually started. The road surface required considerable care on the part of the competitors to avoid some nasty sideslips. As is now customary, no times are available, an "order of merit" only being officially issued. These results of the handicap for each class in handicap order were as follows:—

Motor bicycles (10 starters).—1. F. J. Ellis, $2\frac{3}{4}$-h.p. Matchless (single-cylinder De Dion engine 76 × 76 mm.).

2. L. W. Bellenger, $3\frac{1}{2}$-h.p. Quadrant (single-cylinder Quadrant 81 × 88 mm.).

3. O. C. Godfrey, 4-h.p. Werner (2-cylinder Werner 60 × 88 mm.).

Bellenger made the fastest actual time.

Tricars (7 starters).—1. W. Gunn, 2-cylinder 10-h.p. Lagonda, 90 × 96 mm.

2. W. P. O'Reilly, 1-cylinder C.I.E., 4-h.p. 80 × 85 mm.

3. T. A. Read, 2-cylinder 9-h.p. Singer, 86 × 90 mm.

Gunn made fastest actual time.

Turin Motor Cycle Race.

ON Sunday last the 60 kilom. race for motor cycles on the Turin-Pino-Chieri-Villanova road resulted as follows:—1. Rigat, 51m. 15s.; 2. Voarino, 1h. 2m. 4s.; 3. Bellorini, 1h. 5m. 10s.; 4. Battagliotti, 1h. 6m. 40s.; 5. Lorenzetti, 1h. 14m. 11s.

CLUBS AND ASSOCIATIONS.

Essex Motor Club.

THE annual general meeting of the above club was held at the headquarters of the club, Castle Hotel, Woodford, last week, Mr. W. H. Bishop, the honorary solicitor of the club, in the chair. The report and balance-sheet which the committee and secretaries were enabled to submit to the members showing a strong financial and social position.

Among the important business of the meeting was the changing of the name of the club from that of the "Essex Beaumont Motor Club," to the "Essex Motor Club," by which latter name it will be known in the future.

The new committee elected comprised: Messrs. Lowe, Prentice, Horswill, Richards, Norris, and Macdonald. *Captain*, Mr. Owen L. Summers; *Riding Officer*, Mr. G. E. Revell; *Secretaries*, Messrs. A. George Reynolds and Ernest J. Bass. *Hon. Solicitor*, Mr. W. H. Bishop. *President*, Mr. Arthur Du Cros, J.P.; and *Vice-President*, Mr. Fred Pluck.

The secretaries announced that they were in hopes of promoting a competition, now that cars were getting numerous in the club, for cars alone; in addition, they were working out, amongst other competitions, a 150-mile non-stop, to take place in Essex.

Herefordshire A.C.

AT the annual general meeting of this club, held at the Mitre Hotel, Hereford, when Mr. J. T. Hereford presided, the hon. secretary and treasurers' report showed a balance of £25 6*s*. to the club's credit, with no liabilities.

Col. Hopton was elected president for 1906, and the names of Col. Scudamore and Mr. J. H. Bailey were added to the vice-presidents who were re-elected. The whole of the committee were re-elected, with the addition of Mr. S. Butt-Ekins, who has promised to act as assistant hon. sec. to Mr. Wilfrid Groom, who was re-elected hon. secretary and treasurer.

Hertfordshire County A.C.

AT the annual general meeting of the Hertfordshire County A.C., the fusion of the West Herts Motor Club was confirmed.

The retiring chairman, Mr. Noel B. Kenealy, presided.

The report and accounts of the past year were submitted and passed, and willingness to serve as follows on the part of several distinguished members was announced:—

The Right Hon. the Earl of Clarendon, president, and as vice-presidents: H.S.H. Prince Louis of Battenberg, the Right Hon. the Earl of Verulam, Lord Hyde, Sir Charles Forbes, Bart., Lord Essex, Lord Malden, and Dr. Lovell Drage.

The committee was enlarged to fourteen members, of whom Mr. Charles McWhirter was elected to the chairmanship for the coming year.

Motor Union Provincial Meetings.

THREE meetings of the Union in the provinces have been been fixed for 1906, viz., May 26th, at Birmingham, July 21st, at Bath, and September 22nd at York. The programme of arrangements locally is being left in the hands, respectively, of the Midland, Somersetshire and North Yorkshire Clubs.

An Imperial Organisation.

A CONSIDERABLE number of motorists in the Colonies and British dependencies are now joining the Motor Union, and are thus extending its influence and powers of being useful in other lands. The Union has members in Malta, Australia, New Zealand, Cape Colony, India, the West Indies, West Africa, and elsewhere. Last week, two applications for membership were received from India, and one from the Transvaal. Mr. A. E. Lamb, chief of the Hansard staff in the Transvaal, in forwarding his application for membership from Pretoria, has offered to cordially co-operate with the Union or the A.C.G.B.I. in connection with obtaining information with regard to motoring in that part of the Empire.

Motor Yacht Club.

"ENCHANTRESS" is the London telegraphic address of the club.

Wolverhampton A.C.

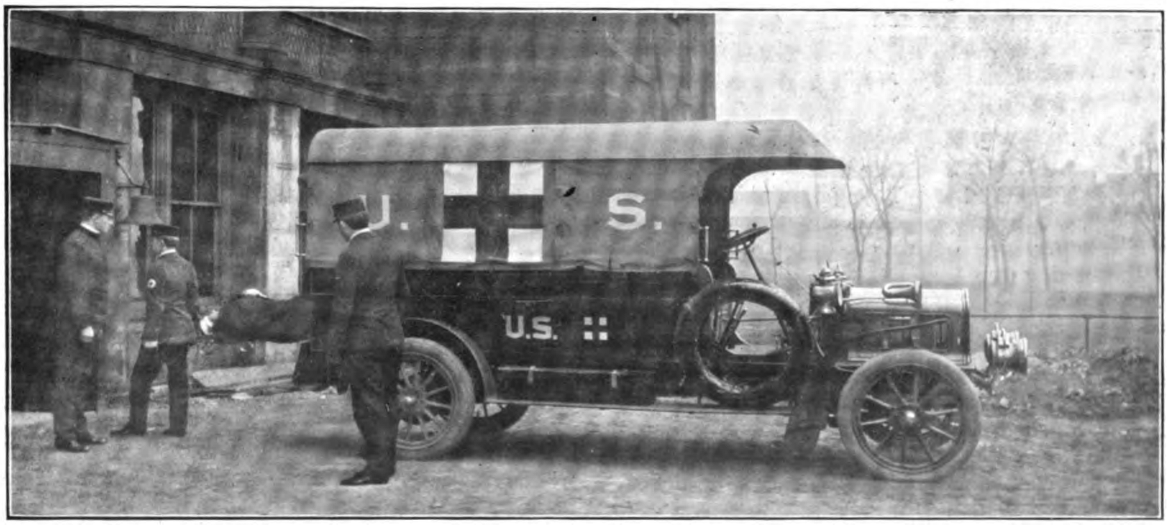
AT the annual general meeting of the club, when Mr. E. Lisle, the president, occupied the chair, the report and accounts, which were highly satisfactory, were unanimously passed.

The following officers and members of committee were elected:—*President*, Mr. T. Cureton. *Vice-Presidents*, His Worship the Mayor, Captain Burnett, Messrs. J. H. Cooksey (Town Clerk, Bridgnorth), J. O. Evans, T. T. Mills, W. G. Owen, and T. F. Young. *Treasurer*, Mr. G. H. Evans. *Secretary*, Mr. S. R. Rhodes. *General Committee*, Messrs. F. C. Bishop, Fred Bayliss, J. W. Davis, W. H. Evans, T. G. Gatis, T. Lisle, A. W. Moore, and H. W. Stroud.

For the purposes of affiliation with the Motor Union, it was decided to divide the club into (a) An Automobile Section (b) A Social Section, and resolved that the former section should join the Union.

Aero Club.

AT the last meeting of the committee the following were elected members:—The Lord Aberdour, Lady Aberdour, Miss Elsie Owen, Capt. W. A. de C. King, R.E., Lieut. W. T. Caulfield, R.E., Mr. Vere Ker-Seymer, Mr. J. St. John Gore, Mr. A. B. Randolph, Mr. G. Lloyd Jones, Mr. Codrington Crawshay, and Lord Royston.

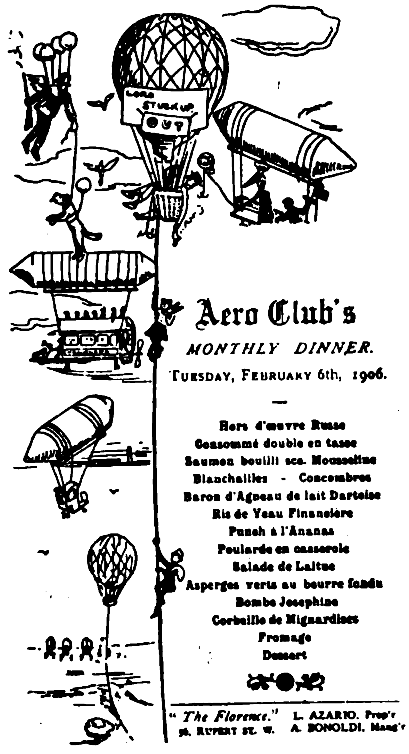


As in the British Army, so motor ambulances are now receiving attention in America for forming part of the regular ambulance corps. The first built to the order of the United States Army is seen in our photograph, and is a standard 18-h.p. White Steam Car with lengthened wheel base measuring 10 ft. 8 in. Plenty of room is thereby provided for carrying the wounded. Altogether the White cars have from the first found much favour with the American military authorities. Three of this type, it will be remembered, were used in 1904 by General Corbin, during the extensive manoeuvres held at Bull Run, and again last year four "Whites" were employed in the manoeuvres of the Massachusetts State Militia.

AERONAUTICS.

The Aero Club Dines.

COMMENCING with February, the Aero Club of Great Britain and Ireland have instituted regular monthly dinners, where it is hoped the interests of the movement will be considerably helped, as discussions naturally follow the banquets and new recruits are enrolled. The first dinner took place on February 6th, and we reproduce the humorous menu used for the occasion. Amongst those present were the chairman, Mr. Roger W. Wallace, K.C.; Professor Huntington, of King's College; Colonel Capper, C.B., R.E., Director of Military Ballooning; the Hon. C. S. Rolls; Mr. T. C. Aveling, of the Midland Automobile Club; Mr. Patrick Alexander; Mr. Frank Butler; and also Messrs. Pollock and Dale, who recently crossed the Channel in the club balloon.



Aero Club's

MONTHLY DINNER.

TUESDAY, FEBRUARY 6th, 1906.

—

Hors d'œuvre Russe
Consommé double en tasse
Saumon bouilli sce. Mousseline
Blanchailles - Concombres
Baron d'Agneau de lait Dartoise
Ris de Veau Financière
Punch à l'Ananas
Poularde en casserole
Salade de Laitue
Asperges verts au beurre fondu
Bombe Josephine
Corbeille de Mignardises
Fromage
Dessert

"*The Florence.*" 56, RUPERT ST. W.
L. AZARIO. Prop'r
A. BONOLDI. Manag'r

Humorous Menu Card of the First Monthly Dinner of the Aero Club.

Flying Machine Experiments at Aldershot.

IT will come as a pleasant surprise to many people in this country interested in the problems of aeronautics, to find that the experiments which the military authorities at Aldershot have been carrying out recently, go a great deal further, and are of a more interesting character, than the mere tests of Mr. Cody's man-lifting kites, to which we recently referred. In fact, a large number of instructive gliding experiments appear to have been conducted under the supervision of Mr. Cody and Col. Templer, who is the moving spirit both of the Military Ballooning and Aeronautical Departments, and of the employment of mechanical traction for army purposes. An apparatus has been constructed, we understand, very similar to, if not identical with, the Wrights' aeroplane, which in Aldershot is known by the general nickname of "The Glider." It consists, that is to say, of two superposed aerocurves with guiding appliances, and, as in the Wrights' aeroplane, the aeronaut lies prone in the middle of the lower wing. This apparatus has been taken up by kites, and released at heights of as much as 500 ft., when long and thoroughly successful glides have been carried out with it, Mr. Cody in one case making a record glide of as much as half a mile, while a number of the engineers have also experimented with it, and, though not travelling distances as great, have manipulated it perfectly, and in every instance come to the ground without damage or injury of any kind. The "Glider" has not, of course, always been taken up as high as 500 ft., but in some cases, presumably with suitable opposing winds, experiments of, we believe, a not less successful character have been made from the tops of hills.

A Credit to the British Army.

EXPERIENCE and practice in controlling the gliding machine is, as we have always pointed out, most important, if not absolutely indispensable, for acquiring the necessary dexterity, skill, and self-possession for managing the motor-driven flying machine. It is most satisfactory to learn that the special department of the British Army, which concerns itself with such matters, has been plodding steadily along, and making real and substantial progress. To have a number of engineers who have executed free glides in this way, is to have a body of men who will be far ahead of any other experimenters, and probably be able to learn, with much less difficulty than anybody else, the mysteries involved in managing the flying machine of the future. While there has been a lot of talking and writing by people who have done nothing of a practical kind, here we have the British Army working away silently and unobtrusively, without attracting any public attention, in the way best calculated to lead to an ultimate solution of the flying problem. In fact, these Aldershot experiments are, as far as we are at present able to judge, ahead of anything that has been accomplished except by the Wright Brothers, and would seem to be even as good and as triumphant as anything which they had accomplished prior to the autumn of 1903. Of course, with a controllable machine it is probably not so difficult a feat to glide half a mile from a height of 500 feet, as it was in the Wrights' case to glide 300 yards from the top of a sand hillock. It may not necessarily involve quite such complete mastery of the machine, but it does show that effective mastery has been attained. In fact, that is effectively shown even by the shorter glides. A man who can keep an aeroplane of this kind from turning turtle and coming to the ground with a crash, will not, we fancy, be very long in learning how to control a motor-driven machine.

To Avoid Breaking Bones.

VARIOUS proposals have been put forward as regards suitable sites for gliding experiments. M. Archdeacon, in France, it will be remembered, regarded the sand dunes of Berck-sur-Mer, near Boulogne, as the most ideal spot with which he was acquainted. We ourselves suggested the South Downs (particularly in the neighbourhood of Worthing) and now Lord Montagu observes that he is the proprietor of 6 miles (? 6 square miles) of the softest mud on the Solent, covered with a few inches of water when the tide is up, and this he thinks would furnish an ideal experimenting ground, since however forcibly the experimenting aeronaut descends into it, he can hardly be seriously hurt. This is no doubt the case, and probably the experimenter will escape fracture of any of his limbs. But if he descends from 40 or 50 ft. in the air head first into Lord Montagu's soft mud, it is a very doubtful question whether he can be extracted even by the most enthusiastic assistants before suffocation has put an end to his experimenting further, even if the said assistants could get at him without being swallowed up in the nice soft mud themselves.

On the whole we rather suspect Lord Montagu of having a little fun with ourselves and others who have been enthusiastic on aeronautical topics. It is perhaps his delicate way of pointing out that the *place* where experiments are conducted is not of so much importance as the *way* in which they are carried out.

Official Recognition of the Lebaudy Airship.

The Lebaudy airship has for a long time been, *de facto*, a part of the military equipment of France, and now the full formalities have taken place, and the position of the airship among the defences of the country has been formally recognised by the military authorities.

The Military Aspects of the Situation.

At the same time, as we have already chronicled, the Brothers Lebaudy are constructing another airship on almost identically the same lines as the great machine now reposing at Toul. If anything, it will be slightly larger and more powerful, though not much, and the French Government has already contracted to take delivery of it on its completion, which, it is anticipated, will be within about six months from the present date. The French Government obviously has in view a programme which will have the effect of providing each of the great frontier camps and principal fortresses with one of these splendid scouting appliances. If ever war takes place on the French frontier, there can be little doubt that admirable service will be rendered by these vastly improved "eyes of the army," and that the first series of actions will be, to some slight extent, similar to the battle of the air foreshadowed in Mr. H. G. Wells' "Anticipations," to which we have frequently alluded. It will not be quite the same, for the French airships will, as far as can be judged at present, have it all their own way, the possible enemy across the Rhine not having, so far as is known, distinguished himself in the conquest of the atmosphere. The situation, as it exists at present, is a triumph for French technology. No other people seem to be able to build airships of the navigable balloon type that will hold their gas for a sufficient time to be practicable, and be thoroughly manœuvrable at the same time, whilst developing a speed of practical utility.

1907 Developments.

M. Julliot, the able and universally famous constructor of the Lebaudy airships, is getting out a new model to surprise the world in 1907. It is to be more powerful and considerably speedier than the present "Lebaudy," and alterations in the arrangements of the firm are being organised in connection with it. Hitherto, as our readers are aware, the whole of the airships have been constructed at Moisson. In future, however, the mechanical portions, *i.e.*, the hull, the motor, the propellers, &c., are to be built in Paris in the workshops attached to the Lebaudy sugar refinery in the Rue de Flanders. The gas-vessel is to be constructed, and the final assemblage of the airship is to take place, at Moisson.

A Similar Machine for Great Britain.

The enthusiastic aerial department at Aldershot, to whose experiments in aeroplanes we have drawn attention above, is also arranging to build a machine, on what may be regarded as the Lebaudy lines, for military purposes in this country. The British airship will be an imposing affair, the gas vessel being 132 feet in length and 25 feet in diameter with conical ends, and will contain some 70,000 cubic feet of hydrogen. It will have a lifting capacity of over 3 tons. The skin of the gas-vessel is to be made of a number of layers of gold-beaters' skin, which, it is said, will be particularly able to withstand any tendency to cracking or tearing. The hull, which is more like the Santos-Dumont type than that of the Lebaudy airship, is to be provided with motors developing 40 h.p., and these will drive propellers at both ends, while the tests already made lead to the conclusion that a speed of 25 miles an hour will be attainable.

The race towards perfection between the navigable balloon type of machine and the aeroplane, which people living at the present day are privileged to witness, is probably the most interesting competition in the development of man's control over the forces of nature which the world has yet seen.

More Doubtful Methods.

We last week reproduced a photograph of the Hamilton aeroplane, which has given such a sorry account of itself on the Florida Beach, and pointed out some of the reasons which, in our opinion, were among the causes of its want of success. A little previously we referred to the experiments of Mr. Ellehommer in Denmark, and M. Vuina near Montesson. From information which we had received in regard to the performances of the Danish experimenter, we believed, and stated, that he had actually executed free flight through the atmosphere, even though only for a distance of 50 metres. Since then further details of his machine have come to light, and, though we would not like absolutely to deny the possibility of its having left the ground for a short distance, we feel quite convinced that a machine of this type is not at all likely to accomplish sustained satisfactory free flight. It consists essentially of a central arch of canvas, or similar material, on either side of which are stretched two big wings. A propeller is mounted in front of the arch, where it is supposed to develop the necessary propulsive force, and the whole arrangement is mounted on quadricycle wheels. That this arrangement could succeed in carrying an aeronaut on a quadricycle any distance, we find it difficult to persuade ourselves to believe, as also that it could be successfully manipulated in the air for any length of time.

We may in general make the same observations in regard to the Vuina machine, which also simply consists of a quadricycle with motor and propelling mechanism and large wings, the shape of which suggests a cross between a bat and an ordinary umbrella.

The chief difficulty with constructions of this kind is that the prospects of attaining real rigidity with the wings are more than problematical. In the Wright and Chanute type of machine the two surfaces or aerocurves are tied and strutted together, and the whole produces a compact and rigid structure. Not so with the expanded bird-like wings. To give them anything like the same degree of rigidity, a complicated system of vertical rods and ties extending above and below the wings appears an absolute necessity, and that is handicapping the machine most seriously.

* * * *

Twenty Years' Horseless Carriages.

On Wednesday last a very interesting paper on "The Horseless Carriage, 1885–1905," with numberless illustrations, was read by Mr. Claude Johnson, at the Society of Arts, John Street, Adelphi, W.C. The chair was taken by Colonel H. C. L. Holden, R.A., F.R.S., who is a member of the Council of the Society.

MOTOR BOATING.

A Club Launch.

IN connection with the Motor Yacht Club floating club house, a sea-going pinnace, by Messrs. Thornycroft, is to be regularly employed in maintaining constant communication with the shore. The launch will be mahogany built, 30 ft. in length, with 6 ft. beam, and will draw 2 ft. 10 in. of water. The engine will be a 4-cylinder, 4¼ by 5, 24–30-h.p., low-tension magneto ignition, and a cabin, 6 ft. 6 in., with a head room of 5 ft., will be fixed, having glass sides, so that passengers in wet weather will not be discomfited.

The Johore Cup.

A CUP, to be raced for during the coming season, has been presented to the Motor Yacht Club by the Sultan of Johore.

International Cup Race.

ENTRIES for this race—which will probably be held off Cowes during August—will close on July 1.

British Motor Boat Club.

THE new burgee of the British Motor Boat Club, which is quite different from any published in Lloyd's Yacht Register, is blue with a red St. Andrew's Cross (diagonal cross) with a white border.

The racing fixtures for this season will probably be, June 5th, Oulton Broad; June 8th and 9th, Liverpool; a date in July at Cowes, in Cowes Week in August, and at Burnham in early September.

* * * *

Armour-Clad Cars.

THE idea of armouring motor cars for military purposes, which was first, we believe, proposed in this country by the notorious E. J. Pennington in the early days of automobilism, and subsequently brought up again by Mr. F R. Simms, a description of whose machine appeared in THE AUTOMOTOR JOURNAL for the 19th April, 1902, would seem to be coming to the front again. Possibly it is the revolutionary state of affairs prevailing in Russia which has provoked this return to the militarisation of the automobile. At any rate, Messrs. Charron, Girardot, and Voigt, have just completed the first of a number of such vehicles for the Russian Government who have, doubtless, at present good cause to require their services, and another similar arrangement, constructed by the Opel-Darracq Company, was exhibited by that Company at the recent Berlin Automobile Exhibition. We, this week, reproduce a photograph of the C.G.V. machine, and draw attention to its leading characteristics in the title. The Opel-Darracq military automobile is an ordinary 4-cylinder touring car, developing 40 h.p., and is armour-plated, or, at any rate, provided with bullet-proof plates to reach above the heads of the occupants. These can be removed, and the car employed as an ordinary touring car if needed. Its total weight, when fully armoured and provided with its guns, amounts to 2,400 kilogs., in which condition it is said to be capable of developing a speed of 40 kiloms. per hour. The armament of the car consists of two Mauser quick-firers and two Mauser quick-firing pistols. The car is also equipped with a telescope on a stand.

Railway Motor Coach Privileges.

ONE is compelled to wonder what is happening to the Board of Trade in its hoary old age, unless it be a most spasmodic rejuvenation under its new head. For the six new rail motor cars which the Great Northern Railway have been adding to their stock are actually to be allowed to run on the rails and stop at intermediate spots where there are no stations. It will be a great convenience to the local population, no doubt, but the most encouraging feature of the situation is the extraordinary revolution of ideas at the Board of Trade, of which the granting of such a concession is evidence.

A Side-Slip Catastrophe.

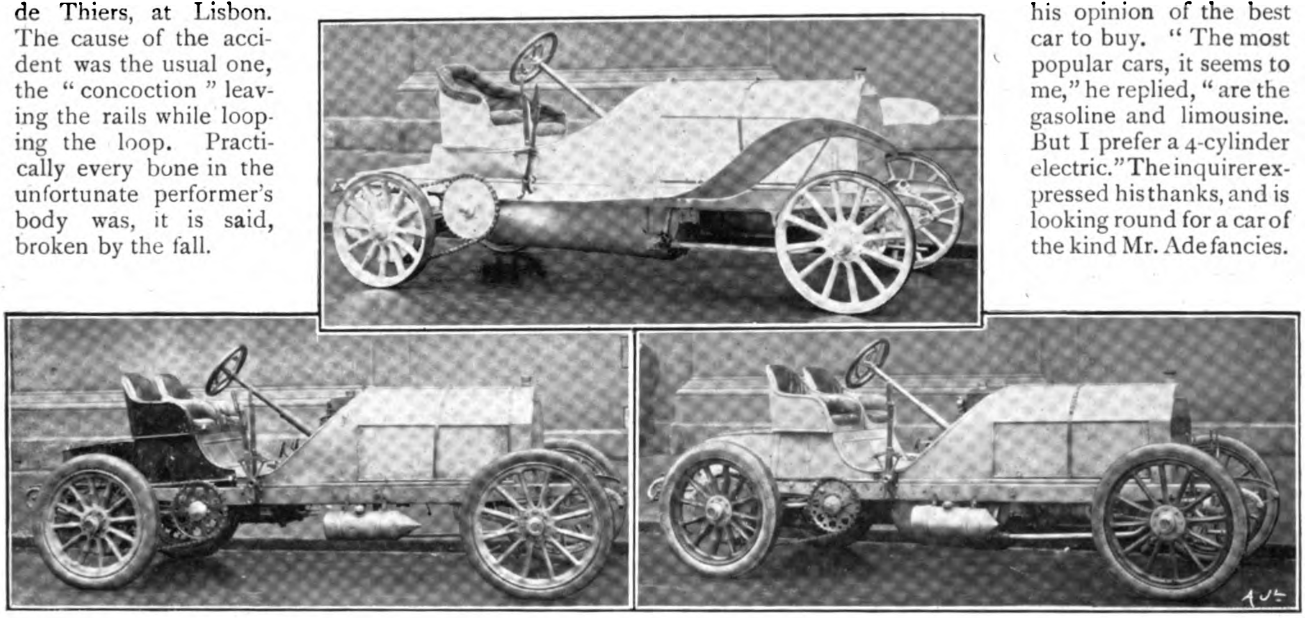
WHEN motor omnibuses were first put on the London streets, shod with solid rubber tyres, many people, realising their huge weight and the number of times they would have to be stopped, turned, and otherwise manœuvred on streets often so slippery that the London cab horse, in spite of his many years of practice, can only keep his footing upon them when encouraged by "strange oaths," predicted that motor 'buses would be slithering about the Metropolis like a herd of hippopotami on an ice skating rink. The prophets of evil have in this, as in so many other cases, been utterly out of it, and the motor omnibus has surprised its patrons quite as much by its absence of side-slippiness as by its high average speed, controllability, and perfect genius for picking its way through crowded traffic. One of the first, if not the first, motor 'bus side-slip accident, which has resulted in a coroner's inquest, is an occasion, therefore, of very particular interest, and so are both the coroner's remarks and the verdict of the jury. The victim of the accident on whom the coroner's jury "sat" came by his end through being knocked over by the 'bus, just as he was alighting from it. A van—in this case, as in so many, the *fons et origo mali*—pulled up sharp in front of the 'bus, as they not infrequently do. The 'bus driver, to prevent a collision, clapped on his brakes, and the 'bus in consequence skidded, throwing off a passenger who was standing on the steps, and who in consequence suffered injuries to which he succumbed. The coroner, in summing up the case, made the general statement that all vehicles were liable to side-slip, but the way in which the side-slip occurred in a motor omnibus was more serious than in a horse-drawn omnibus, and added some remarks about sufficient being known regarding the tendency to side-slip to make the responsibility of motor 'bus drivers a very serious one. "They were bound," he said, "to know that a skid might occur, and the consequences might be serious injury to human beings, though in this case it could not be maintained that there was anything like serious neglect." The jury returned a verdict of "accidental death." That horse-drawn vehicles do not enjoy the comparative immunity from skidding apparently claimed for them by the coroner, was, however, pretty well illustrated recently at Surbiton. The local fire-engine was summoned to the Assembly Rooms, and the brigade, with the horse-drawn "steamer," proceeded to the scene of the conflagration at the usual high speed. Suddenly the wheel of the vehicle skidded on a tramway line, and horses and vehicle dashed in consequence into a stone wall surrounding a garden. The front of the fire-engine was smashed and the poor horses were injured, one of the firemen also sustaining slight injuries. And the fire brigade was the victim of a false alarm all the time.

Provincial Exhibitions.

Local motor and bicycle shows have been opened simultaneously in the provinces this week, at Manchester, Liverpool, and Newcastle, at which most of the leading makes of cars which have already been seen at Olympia are again represented. The clashing of dates, however, precludes all having an equal chance in this respect. Both at Liverpool and Manchester, however, a strong contingent of makers of commercial vehicles is in evidence, and help to make a show which is particularly suited to the requirements of the respective districts.

A Useless Death.

Another victim of those scandalous accidents due to the popular love of sensationalism—looping the loop in a concoction misnamed a motor car—which has already claimed one victim—a useless tragedy on which we commented forcibly at the time—has caused the death of Mademoiselle Mauricia de Thiers, at Lisbon. The cause of the accident was the usual one, the "concoction" leaving the rails while looping the loop. Practically every bone in the unfortunate performer's body was, it is said, broken by the fall.



Three "generations." Mercedes developments in Racing Cars during the past three years. Our upper illustration shows the very latest 120-h.p. model which has just been received by Mr. J. E. Hutton from the Cannstatt works. Beneath are photographs of an 80-h.p. car, built in 1904, and one of the 90-h.p. racers of last season.

The Gentlemanly Chauffeur.

There ought to be an opening for the gentlemanly well-educated chauffeur, who should be able to talk agreeably on all subjects as well as drive your car, and when the weather is too bad to take the vehicle out, can act as secretary, shorthand writer and typist in the house. At any rate, there is one enterprising young man who is able to do all this sort of thing, and who, as the following advertisement shows, is anxious to obtain a situation :—

> WELL-EDUCATED, gentlemanly young man (24), of good appearance and address, desires engagement as confidential clerk and chauffeur, private; town or country; shorthand and type-writing; thoroughly experienced; any petrol car; all running repairs; genuine.

That such an "Admirable Crichton" as this should be in want of a job is nothing less than a tragedy on a small scale. He has apparently modelled himself on Mr. and Mrs. Williamson's "Lord Richard Barrymore" in "My Friend the Chauffeur," and having studied for the part for some time, now thinks that he is capable of making his *debut* in it.

Motor Car Licence Staff to be Increased.

Owing to the great increase in the work, five instead of two L.C.C. officials have been empowered to sign motor licences.

A Yankee Yarn.

Mr. George Ade, the American dramatist, is the more or less proud possessor of a little Oldsmobile runabout, which he dubbed The Rolling Peanut. His experiences as a motorist he has published in a short story under that title, which the makers of the car have reproduced in booklet form, and distributed by tens of thousands at every American motor show. One of his admirers, after reading the story, says the *Standard*, approached Mr. Ade for his opinion of the best car to buy. "The most popular cars, it seems to me," he replied, "are the gasoline and limousine. But I prefer a 4-cylinder electric." The inquirer expressed his thanks, and is looking round for a car of the kind Mr. Ade fancies.

Fox Shooting.

The First Annual Dinner of the Bradford Automobile Club, which came off at the Royal Hotel in that city last week, is likely to be memorable in the recollections of Yorkshire Justices. Mr. Mitchell, who was one of the leading members present, proposed the Automobile Club of Great Britain and Ireland, and in the course of an entertaining speech he told a story of a friend of his who, when being fined before a fox-hunting Bench of Magistrates, and asked if he had anything to say, replied, "Yes. It is quite evident you intend to stop our sport, and if you do that we intend to stop yours. Every time I am fined now I shall shoot a fox, and get level with you in that way." As the shooting of a fox in Yorkshire and most English counties is looked upon as a crime somewhat worse than manslaughter, if not as bad as murder, the feelings of the magistrates may be more easily imagined than described.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

FOUR CYLINDERS AND SIX CYLINDERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I greatly regret to find that Mr. Edge has endeavoured to convey, in various communications to the Press, the impression that I am backing down after having made a challenge against 6-cylinder cars. As regards the correspondence which has taken place, the whole of this is available in the public Press, and I leave judgment in the matter to any fair-minded person who cares to read it.

Mr. Edge is certainly the person whose name is at present most associated with 6-cylinder cars, this association being, if I judge aright, entirely of his own seeking.

The facts speak for themselves, however. Mr. Edge made so many claims for 6-cylinder cars that I issued a general challenge. This has been taken up—by Mr. Claude Johnson! I think further comment is needless.

Yours faithfully,
H. H. P. DEASY.

February 13th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—It is really surprising this correspondence on the number of cylinders, whether they shall be 4 or 6, and at the same time excluding 8. Providing that in naming the number of cylinders, only that number of pistons are indicated, and that each cylinder has not two pistons. A much larger question is whether two pistons working in the continuation of one cylinder in contrary directions to one another, and making one set of valves for two impulses on the crank, is, or is not, the correct principle to employ.

Dealing with the number of piston impulses given to the crank is child's play and unworthy of serious correspondence. It is simply this—which no one can contradict. The more the merrier! To argue against this would be to contend that a water-wheel would run smoother, and be more efficient by having four buckets in its circumference than one having 100 or 200.

The only objection to increasing the number of cylinders is to be found in increasing the number of working parts, *unless* a rhythm of impulse to be given to the crank-shaft, necessary to the smooth working and wearing of all parts, cannot be gained without this. Regarding in this light cylinders as being only the exteriors of the pistons in which they work.

But a better system has been established in part by the Gobron-Brillié and Arrol-Johnston cars, in which systems two pistons work in contrary directions, and so make the *possibilities* of reducing the number of valves and parts by half. Remember, I do not say they actually do so; but on this system, one impulse *can* be given to the crank on each revolution on the ordinary petrol engine, and the number of valves and their wearing parts reduced by half.

It is absolutely useless to prove to a point by using cars whether 4, 6, or 8 cylinders are correct, by allowing cars commonly sold by standard patterns to compete.

However, this is patent to us all, that the 8-cylinder Darracq is a victor in establishing world's records.

In concluding this letter, I would like to bring forward a fact with regard to cylinder construction, which has been absolutely proved correct by the performances of the 82 × 82 3½-h.p. Minerva motor cycle engine—which is this, viz., the greatest cubic capacity of gas can be got within the walls of a cylinder, and the minimum friction speed of the piston, by making the bore and stroke of equal dimensions. Here we find the greatest economic efficiency, provided that the number of revolutions of the engine will admit of the speed at which the gases can be burnt, shall not be above this, otherwise we find burning gases in a blue flame emitted from the exhaust ports.

Efficiency with economy is part of the Tourist Trophy Race, and this is part of its principle.

Yours faithfully,
Pangbourne, Feb. 12th. J. M. NAPIER.

FALSE RUMOURS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—It has come to our knowledge that certain ignorant and prejudiced persons are spreading false reports with reference to the Arrol-Johnston cars which ran in last year's Tourist Trophy Race, and gained first and fourth places. It is stated that in order to reduce weight they were fitted with paper bonnets, mudguards, &c., and that all extras were taken off with the same object; and, further, that the petrol tanks were placed in absurd positions with the object of gaining power, the position being an impossible one in an ordinary touring car.

We wish most emphatically to deny each of these statements. Our cars were built from parts of standard design throughout, with the exception of the frame and wheels, which differ from our standard practice in so far as they are made lighter to allow the chassis to come within the maximum limits as to sizes and weights imposed by the stringent rules laid down by the Automobile Club. As a matter of fact, the weight of the chassis was only a few pounds below the maximum imposed, so that it is apparent that no attempt was made to procure a light racing machine for the Tourist Trophy event only, but a machine was produced which has proved itself capable of the hardest work under ordinary touring conditions.

As to extras, the car of course ran with a complete set of lamps, spare parts, tools, tyres, horn, dashboard clock, air pump for petrol tank, and in fact, all accessories that are usual and necessary on motor cars.

With regard to the position of the petrol tank, this was fitted under the back seat in a usual position, and it was pressure-fed from the exhaust.

We, in common with other manufacturers, received before the race certain rules as to sizes and weights, and we were careful that the car was built in such a way as to comply with these rules in every respect, so that no alterations of any kind were either suggested or demanded by the Club officials before the race, and both cars therefore, raced exactly as they left the works.

The winning car has been, and will be exhibited, at Olympia, Edinburgh, Liverpool and the Glasgow Motor Shows, and is there seen exactly as it ran in the race, so that the public may satisfy themselves as to whether it is a standard vehicle or not.

It has been stated that our cars were very low—specially-built racing machines—and that consequently great speed could be obtained. This is not the case. The "Arrol-Johnston" chassis was higher from the ground than that of any other competing car with but two exceptions. The height of the backs of the seats were also higher than is this year fixed as a minimum. The fact of the case is that the car looked lower than is usual, this optical delusion being due to the fact that the car was fitted with a low and broad bonnet and had large tyres on the wire wheels, the tyres being "Continentals," 815 by 105 mm. on all wheels. We were able to fit a low bonnet on account of the centre of gravity of a horizontal engine being very much lower than in the case of a vertical engine, and we fail to see why we should fit a high bonnet—which affects the speed and petrol consumption of a car—merely because other people require to do this on account of the design of their engine. We are surely entitled to take all the benefits we possibly can derive from the use of a specially-designed and efficient engine such as ours is.

We trust that you will see your way to publish this somewhat lengthy letter, but the persistent manner in which the statements referred to are being circulated is annoying.

Yours truly,
For THE NEW ARROL-JOHNSTON CAR CO., LTD.,
John Napier, Managing Director.

Paisley, February 12th.

EXAMINATIONS FOR AUTOMOBILE CLUB CERTIFICATES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I desire to ask your kind assistance in making known, through your valuable medium, that owing to the already large number of entrants the examination for the above certificates, already announced to be held in London, on Wednesday, February 21st, will be continued on the following day.

It is necessary that all who desire to attend these examinations should send their application forms so as to reach me not later than the first post on Monday, February 19th.

I am, yours faithfully,
J. W. ORDE,
February 12th. Secretary.

FUEL CONSUMPTION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Interested partisans of 4-cylinder motors have made statements in the public Press that a 6-cylinder car was wasteful of petrol. Knowing this to be untrue I had an official petrol consumption test carried out on the same 6-cylinder Napier which recently ran under the Automobile Club's observation from Brighton to Edinburgh on top speed.

The result of this petrol consumption test is an overwhelming demonstration as to the extraordinary economy of the 6-cylinder engine, as you will see from the copy of the official certificate which I enclose.

The run took place on February 8th from Barnet to Grantham and back—200 miles—and the consumption worked out at 18·78 miles per gallon.

The certificate points out that the roads were very stony in places, for the greater part of the distance were wet and greasy, and that the temperature was low, being as low as 31 degs. Fahr. at the finish of the run and 36 degs. Fahr. at the start, so that what the standard 4 in. by 4 in. 6-cylinder Napier would do in fine summer weather with dry roads, would, I think be at least 10 per cent. to 20 per cent. better than even this magnificent performance.

It is pleasing to think that not only has Mr. Napier led the world with his 6 cylinder principle, but also he has been right from the first that the petrol consumption is extraordinarily small for 6 cylinders, having such a large total capacity as the officially certificated engine in question, which disproves once and for all the sole remaining argument against 6 cylinders.—Yours truly,

Feb. 10. S. F. EDGE.

Automobile Club Certificate of Performance.

Supplementary to the certificate issued in connection with the run on highest gear from London to Edinburgh on October 10th, 11th, and 12th, 1905.

The object of the run made on February 8th, 1906, under the official observation of the A.C.G.B.I. was to ascertain the petrol consumption per mile of the same 30-h.p. 6-cylinder Napier car which ran from London to Edinburgh.

The car was the same in all respects, with the exception that 16-tooth sprockets were fitted on the countershaft instead of 12-tooth. The weight of the car and four passengers on February 8th, 1906, was 4,227 lbs.

The run commenced at the twelfth milestone from London on the Great North Road, which was followed through Grantham for 100 miles, and thence back to the twelfth milestone, where the petrol consumption was ascertained by the *club's* Observer.

The total amount of petrol used was 10 gals. 2 qts. 1 pt. 4 ozs., which is equivalent to 18·78 miles per gallon.

The roads were very stony in places, and for the greater part of the distance were wet and greasy, this being especially noticeable on the return journey. The wind was strong, and varied from about S.W. to N.W.

The temperature was low, as the following observations taken on the road show :—

7.13 a.m. (start) ...	36° F.	1.48 p.m. ...	41° F.
9.0 a.m.	40° F.	3.27 p.m. ...	38° F.
11.30 a.m.	47° F.	6.13 p.m. ...	31° F. (end)

Tyre troubles were experienced on four occasions during the run, which caused considerable delay.

There were no mechanical troubles of any kind.

THE FLYING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

Sir, —I should like to hear if Mr. Roe's model, illustrated to-day, is to scale, or only a toy ; according to the teaching of S. P. Langley, the Brothers Wright, Sir H. Maxim, and others, the results from small models are so illusive as to be practically of no use.

If a scale model, according to the data of the Wrights' 1900, '01, '02, '03, '05 full-sized machines, it does not resemble, only in one or two points.

Again, if built full size, from the same proportions, it would lose one of the Wrights' distinctive features, namely, reduction of friction.

They, by careful design of framework, &c., were able to reduce the body resistance to 50 per cent. of what had ever been done before.

Until recently I was always under the impression, if you were attempting to build or experiment with any little-known subject, the usual thing was to read up all the available data relating to the object. It almost seems that this is not followed by most aeronautical experimenters. Witness the Hamilton plane; it can be shown that a plane of the dimensions given, about 22 ft. wide, 16 ft. long, by 6 ft. between the planes, total effective area about 425 sq. ft., with planes not properly supported (as the shape would alter very much when carrying a weight), would require 50 per cent. more power to propel than a Wright machine of similar size.

Such problems as equilibrium seem of minor importance.

Then, again, we have in to-day's *English Mechanic* Mr. E. Wilson's machine, which is said to be nearly ready for trial.

It appears to be a combination of an aerial screw machine and aerocurve. He proposes to uplift a machine 40 ft. long with transverse aerocurves, rudder, four 7 ft. diameter aerial screws, two 5 ft. diameter propelling screws, and a Blake 12-h.p. motor, aeronaut, &c., total weight 300 lbs. The motor 70 lbs., aeronaut 130 lbs. = 100 lbs. for framework, gear, screws, &c.

Now, the Wright Brothers found it necessary for safety, even in their gliding machines, to have not less than 100 lbs. weight of material. Also, according to available data, the thrust to be obtained from four small 7 ft. diameter screws, 12 h.p. would not be enough by fully 50 per cent. Of course, equilibrium is again very easily obtained.

Yours,

Acton, February 9th. MICA CAM.

AN EXPERT'S OPINION ON 6-CYLINDER MOTORS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The opinion of very few expert automobile designers is held to be of such weight as that of Herr Maybach, to whose designing and continuous care so much of the success of the Mercedes car is due. It is interesting, therefore, to all automobilists to note Herr Maybach's opinions on the question of the use of 6 cylinders which appeared in the *Allgemeine Automobil Zeitung*, in which he states that "one cylinder would be best, two are still acceptable, four are too many, and as for six —!" We may therefore take it that he considers any number over two cylinders too many. Personally I must say that in driving either a 4 or 6-cylinder motor I have not found two extra cylinders either complicated or a drawback, as compared with those of two or four cylinders respectively. He continues, "but if you have ever ridden on a 4-cylinder car then you would not return for anything in the world to a 2-cylinder." And the 6-cylinder enthusiasts believe it to be the same with their new construction. In one thing I cannot but think them right, for "the 6-cylinder motor must possess a wonderful variability of pace." As everyone who owns a correctly-designed 6-cylinder car express themselves in just those words, viz., "that they would not return for anything in the world to a four," Herr Maybach has evidently made an accurate camparison.

After pointing out that the 6-cylinder motor, which he describes as a complication designed with the idea of "driving out the devil with Beelzebub," as it is constructed to run at all speeds on a high gear, and so do away with the necessity of changing speed-gears—which he owns are unmechanical—he goes on to point out that he hopes to bring out a slipping-clutch which will enable a 4-cylinder car to be driven slowly on a high gear.

It appears to me that the necessary complications of a slipping-clutch, and a greater number of gear wheels, which he finds to be the only manner of attempting to bring even a high-class 4-cylinder motor on a par with a 6-cylinder motor, may with even more truth be described as "casting out the devil with Beelzebub" in the attempt to make four cylinders as successful as six.

But Herr Maybach evidently recognises that there are advantages in the use of six cylinders, which seems to me to particularly apply to the ordinary use of a car by an ordinary driver—especially in traffic—for he points out how the use of six cylinders makes a car easier to drive, as he says, "I can only recognise the justification of the 6-cylinder motor in one case. When the driver wants to get along quickly, when he has to keep his hands on the wheel, when he has not time to change gears, or when a wrong manœuvre with the speed-lever might mean costly seconds, then the six cylinders, where the play with the throttle and advanced ignition permits of every speed variation, is fully justified."

It is interesting to hear these opinions in view of the fact that Herr Maybach is now experimenting with a 6-cylinder Mercedes.

I venture to think that even Herr Maybach will agree with me that, taking an engine of a given horse-power, one with six cylinders compared with one of four or less, shows the following advantages for six cylinders : quietness, less shock on all mechanism, less wear and tear on tyres, easier to start, more flexibility, does away with nearly all changing of speeds.

Yours truly,

Feb. 9th. S. F. EDGE.

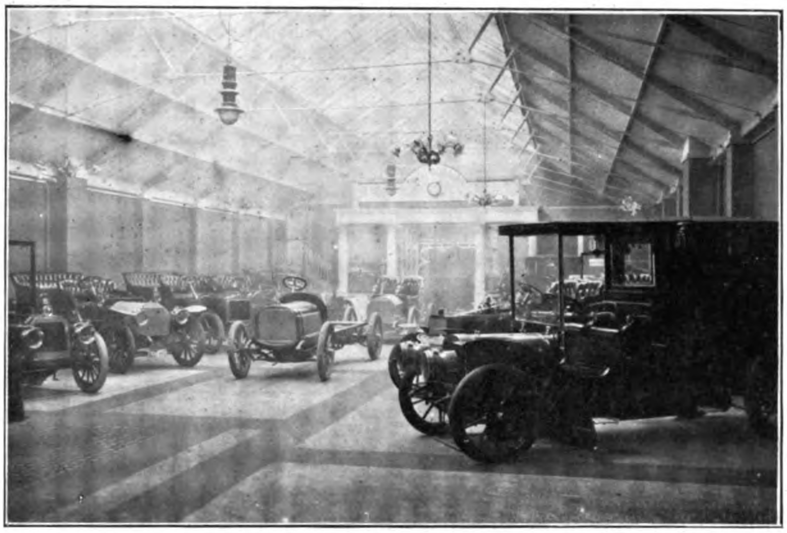
BRITISH *v.* FOREIGN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In connection with the disinterested offer made by Mr. S. F. Edge, to inspect and test in a practical way the construction and performance of his 6-cylinder Napier car, we, having recently availed ourselves of his patriotic offer, are desirous of publicly thanking Mr. Edge, and to state that in our opinion the 6-cylinder car is undoubtedly a great improvement on even 4-cylinder cars. The smoothness of running, and the range of control on top speed, are everything that can be desired, and we have much pleasure in testifying to our satisfaction on all these points.

We are, yours truly,
THE VAUXHALL AND WEST HYDRAULIC ENGINEERING
COMPANY, LIMITED.

Feb. 10th.



"Automobilia," the Motorists' new Emporium in Oxford Street.—A view of the main Garage.

Automobilia—the Motorists' New Emporium.

MOST motorists who are familiar with London know the well-situated premises in Oxford Street, near the Marble Arch, which have since its first connection with motoring been known as Automobilia. A change has come over the place recently, however, and an entirely new management has taken possession—Mr. Easton, who is so largely responsible for the popularity of "The Motor House" being among those concerned in this new departure. It is intended that the premises shall be a "William Whiteley's" in the motor world, and provision is being made for supplying everything that a motorist can need, from the car itself to the chauffeur's livery, and the smallest accessory requirement. Very capacious show-rooms have been opened on the ground floor, where clients may inspect at leisure numerous up-to-date models of modern cars. A special department for hiring out cars has been formed, and the motor clothing and accessory sections are also very complete.

What is a "Show Chassis"?

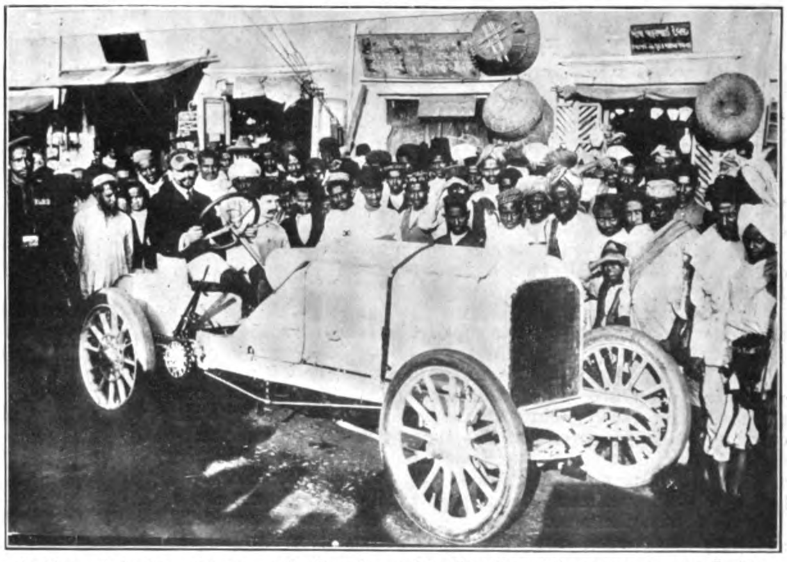
GAULOIS TYRES, LIMITED, have been offering through our advertising columns a prize of a £10 note for the best definition of "What is a Show Chassis"? and we understand great difficulty has been experienced in making the award. Some of the readers have treated it as a conundrum and answered accordingly. Others thought it an occasion for flippant remarks. One gentleman from Bristol said that everybody knew what it was, "except the man who said, 'a chassis was a female chauffeur.'" *He* described it as follows:—"A show chassis is a chassis a replica of which the exhibitor hopes he can kid the public they are going to buy; which the novice believes he is going to buy." Another was a laconic reply:—"It is like beauty, 'only skin deep.'" Some of the replies were technical and descriptive, but at the same time particularly inappropriate, one man sending an absolute essay on what a show chassis is, should be, and should avoid. One sender burst into poetry and contributed a whole stanza. But one thing is certainly made patent by this sort of competition, and that is the very great variety of readers who watch the advertisements, as the senders of answers appear to embrace nearly every class in Society.

Blackpool Retrogressive.

IT was announced some months ago by THE AUTOMOTOR JOURNAL that the Blackpool Corporation had decided not to permit any more motor meets upon the marine promenade. The town is evidently badly bitten by autophobia, as last week the Town Council approved the recommendation of the Watch Committee to refuse an application to introduce a motor omnibus service into the town during the summer season.

Influence of the Automobile on the Railway.

THE automobile is already making its influence felt on the receipts of some of the principal railway companies. Thus it is estimated that of the 1,200 to 1,500 additional first-class passengers from Paddington to Henley who have usually patronised the Great Western Railway, nearly the whole of this number journeyed to the regatta town by automobile last summer. Even at this time of year large numbers travel distances of from 100 to 200 miles; all that the railway companies get out of it being, as one official said, the conveyance of luggage in advance. The receipts of the Great Western Railway Company, when the Court is in residence at Windsor, are now said to show a distinct diminution owing to the same cause.



A Sea of Indian Faces.—M. Sorel, on his De Dietrich racing car in India, has created widespread interest, the natives particularly exhibiting their curiosity. M. Sorel is taking part in race meetings in India, and hopes thereby to further popularise the sport. M. Sorel was one of the trio who tied, as we recently reported, for the Bombay-Mahableshwar Trials. He was also the driver of the De Dietrich car which secured the Coupe de Pyrenees. This work of art came, it will be remembered, to a tragic end at Olympia, in connection with which incident, the sequel is recorded by us this week in the conviction of the thieves who annexed the Trophy.

COMPANY DOINGS.

Motor Omnibuses and the Old 'Bus Companies.

In a measure, the remarks of Mr. Henry Clinch, the chairman of the Associated Omnibus Company, Ltd., and the discussion which followed, at the meeting of the shareholders, on Monday last, were very satisfactory and formed a tribute to the remarkable revolution which mechanical traction is bringing about in the methods of the 'bus companies. Mr. Clinch stated that the introduction of motor omnibuses into their service had given satisfactory results. Motor omnibuses had, he said, rapidly increased, and there were at the present time no less than 260 working on the London streets. There was every prospect of this number being increased very largely during the current year. Motor omnibus companies were springing up like mushrooms in a night; whether some of these would as rapidly disappear remained to be proved. In any case, their company intended to keep abreast with the times in conjunction with the older companies, but they would still move with caution. It was just possible the present motor omnibus might be antiquated in two years' time, so quickly does machinery change and improve, but they were compelled by circumstances to advance quicker than they otherwise should. The "life" of a motor omnibus was still uncertain, but they were providing for depreciation at the rate of 25 per cent. per annum.

London Road Car Testimony to the Motor 'Bus.

We referred last week to the company's report for the past year. The accounts appear to be disappointing, but the figures relating to the motor 'bus are instructive. It states that there has been a considerable reduction in the weekly average receipts of the horse-drawn cars, due to the weather and to the competition of the new motor companies. The cost of foraging the stud of horses shows a decided increase. The cost of feeding per horse per week has been 9s., an increase of 9½d. The cost of bedding per horse per week has been 5d., and of shoeing 7¾d. Motor fuel appears, for the first time, in the accounts at £3,033. The "substitution suspense account" amounts to £17,125, and represents the loss in the substitution of motor for horse cars. The company have 53 motors in work, and there appear to be, in addition, 34 cars and 6 chassis in various stages of completion. In the circular to shareholders of the company, dated 2nd January, 1905, the directors stated "that the substitution of mechanical power for horse traction would be carried out gradually, the existing horses and cars being disposed of by degrees." Owing, however, to the rapid development in motor services by the advent of new competitive companies, it has been found absolutely necessary, in the interests of the company, to considerably accelerate the process of substitution, which will involve the sale of horses far in excess of the number which, in the ordinary course, have been disposed of in each half-year. The directors have accordingly decided to form the substitution suspense account referred to above, and to transfer thereto the value of the horses sold and not replaced, together with the value of the horse cars and harness not required, and this account it is proposed to extinguish by contributions from profits as opportunity affords. Further portions of the company's stables have been, and are being, converted into motor depôts and workshops for motors.

NEW COMPANIES REGISTERED.

"Bettoruss" Non-Skid Tyres (1906) (Limited), Craven House, Kingsway, W.C.—Capital, £1,000 in £1 shares. First directors, A. Duckham (chairman), Mrs. Violet E. Duckham and P. N. Hooper.

C. Fonteyn (Limited) (87,497)—Capital, £2,000 in £1 shares. Object, to deal in motor vehicles of all kinds.

Edinburgh and District Motor Omnibus Company (Limited), 236-9, Finsbury Pavement, E.C.—Capital, £200,000, in £1 shares. Objects, to acquire from the Motor Car Emporium, Limited, certain contracts, motor omnibus chassis, &c. Directors, W. Roberts, Sir Robert Dashwood, Bart., J. Wilson, J.P., and N. D. Macdonald.

Electrocars (Limited), Alderman's House, Alderman's Walk, Bishopsgate Street, E.C.—Capital, £8,000 in £1 shares. Object, to acquire inventions for improvements in electrically-propelled vehicles. First directors, W. N. Stewart, A. R. Baird, and B. W. Parker.

New Leader Motors (Limited), Aspley, Nottingham.—Capital, £15,000 in £1 shares. Object, to acquire the business carried on by Leader Motors, Limited, at Nottingham and elsewhere.

NEW ISSUES.

Deasy Motor Car Manufacturing Company (Limited).—Under the above title a prospectus will be shortly issued. The object of the company is mainly to manufacture in England motor cars, omnibuses and delivery vans, and to acquire the business hitherto carried on by H. H. P. Deasy and Co., Limited, of Brompton Road. We recently announced the intention of Captain Deasy to manufacture a new British car, and the new formation is the result of the work now in progress. Captain Deasy's experience and sound judgment promise well for the new venture, especially when taken in conjunction with the co-operation, as engineer and works manager, of Mr. E. W. Lewis—who has been successfully associated in the past both with the Daimler Company and the Rover Company. Moreover, practical business men will be found as directors of the new company in addition to Captain Deasy, the board comprising Sir Richard W. Griffiths, Bart., Sir Robert W. Buchanan-Jardine, Bart., a director of the Caledonian Railway Company; Mr. E. J. Brook, a director of the Glasgow and South-Western Railway Company; and Mr. K. H. Buchanan, who has been associated with H. H. P. Deasy and Co., Limited, and the London Power Omnibus Company, Limited, and is also a director of the Welsbach Incandescent Gas Company, Limited. A strong feature of the company is that practically the whole of the purchase price is payable in shares, leaving the cash subscribed available for working capital, purchase of land, &c.

A repair department is to be established on a large scale. As already the design of the Deasy car is in an advanced stage, it is hoped that deliveries will be able to be commenced next summer. The capacity of the company's factory will be 250 cars per annum, and it is estimated a net profit of £16,000 per annum can easily be earned upon an output of 200 cars per annum.

The capital of the company is £150,000 in £1 shares, of which £100,000 constitutes the present issue, 18,746 shares are to be issued in part payment for the business of H. H. P. Deasy and Co., Ltd., and 31,254 shares are to be reserved for future issue.

The offices of the company are at 5, Copthall Buildings, E.C.

The Edinburgh and District Motor Omnibus Company (Limited) announces the issue of 190,000 £1 shares at par. The company has been formed to carry on the business of a motor omnibus company, and to establish a service in Edinburgh, Leith, and surrounding districts. The capital consists of £200,000, divided into £1 shares. The preliminary expenses (exclusive of brokerage) are estimated at £6,500, and will be paid by Mr. James Spencer Orr, of Finsbury Pavement House, E.C., who is promoter of the company. He has stipulated that he is to be paid £10,000 in cash, and have allotted to him or his nominees 10,000 fully-paid shares. 150 omnibus chassis are to be acquired from the Motor Car Emporium, Limited, the body portion to be supplied by Messrs. J. Liversidge and Son, Limited.

Wishing you the compliments of the season
24/12/05

After 18 months work, during which time repairs to car have not cost me 20/-. James Harding
Knypersley, Nr Congleton.

Owners of cars have various methods of expressing their pleasure with any particular form of motor car which they may have acquired. The above is an agreeable form of this character, and was sent by Mr. Harding to the Wolseley Motor Car Company, after having used his car for about eighteen months.

COMMERCIAL POINTS.

CLEMENT cars will be shown at the Manchester Exhibition by Messrs. Newton, Bennett and Carlisle, Limited, from February 23rd to March 9th. They will be shown at the Glasgow Show (March 9th–17th) by Messrs. Seligmann, of Renfrew Street, Glasgow.

UNITED MOTOR INDUSTRIES, LIMITED, have just received a communication from Mr. C. J. Glidden, in India, to the effect that the "Castle" accumulators which he has been using all through his Indian journey, have given him perfect satisfaction. The company are naturally gratified at Mr. Glidden's appreciation in view of the climate of India being generally considered to be very trying for electrical accumulators.

A Useful Desk Companion Free for the Asking.

RECENTLY we mentioned that the Shrewsbury and Challiner Tyre Company, of Ardwick Green, Manchester, were sending gratis a folding desk blotter to any of our readers applying to them. The company now write us in regard to this as follows :—

"The result has been an enormous number of applications for the same from all parts of the country, in response to which we have sent a blotter to every applicant.

"We have still a considerable number left, which we shall be glad to circulate amongst those motor car owners who have not yet availed themselves of the opportunity to secure one."

An Illustrated Export Catalogue.

"NEGOTIATORS, LTD.," of 34, Clement's Lane, E.C., are preparing a catalogue of motor vehicles and accessories for circulation amongst users and buyers in the Colonies and non-manufacturing countries. It is to be placed before the chief British Consuls abroad, Chambers of Commerce, and leading Corporations, business houses, and other likely buyers. A work of this character should prove useful for reference in many parts of the world where regular current literature upon most subjects is scarce.

* * * *

LEGAL INTELLIGENCE.

The Alleged "Motor School" Frauds.

FURTHER evidence was given at Westminster last week in the charges of fraud against Riski Medawar, 22, an Armenian, and John Raymond Kerr, 21, respectively the proprietor and secretary of the Motor Drivers' Union, in connection with a motor-driving school, instruction classes, &c. Accused were again remanded.

The Theft of the Pyrenees Trophy.

FREDERICK HALL, alias Prince, twenty-three, bookmaker, of Wilmington Square, E.C., and Robert Henry Burn, nineteen, a jeweller's assistant, of Waterloo Terrace, Islington, were convicted at Clerkenwell Sessions, last week, of having stolen the silver trophy, known as the Coupe des Pyrenees, weighing 900 ozs., and valued at £1,000, from the stand of Messrs. Charles Jarrott and Letts, Ltd., at the Motor Exhibition at Olympia, on November 27th.

In cross-examining Mr. Charles Jarrott, Mr. Symmons (who defended Hall) asked whether the photographic illustration of the female figure in the trophy on the police reward bills was symbolical of the ordinary chauffeur. "I hope not," said Mr. Jarrott, with a smile. "I hope so, too," commented Mr. Symmons, "because the lady is looking one way and driving another."

Hall was sentenced to three and a half years' penal servitude and two years' police supervision, and Burn to twelve months' hard labour.

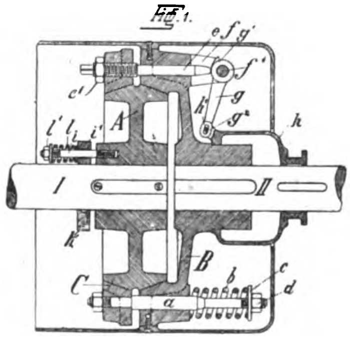
* * * *

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

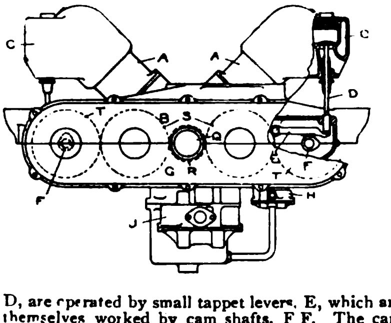
The first date given is the date of application ; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

20509. 10th October, 1905. Improvements in Double Cone Friction Clutches or Couplings. Hugo Baumgärtner-Mica, Mittlerestrasse 80, Basel, Switzerland. Date under International Convention, 10th October, 1904. This invention refers to a double-cone friction-clutch or coupling, having a solid double-cone axially movable upon one rotating part, whilst the other rotating part is provided with a coupling-pulley formed as a hollow cone adapted to fit or engage one half of the double-cone. A pressure-ring adapted to fit the other half of the solid double-cone is movable axially by means of bolts fixed in same, and connected by means of helical spring discs and nuts with the coupling-pulley. There are two figures. Fig. 1 is a central longitudinal section. A is the solid double-cone axially movable upon the shaft, I. B is the coupling-pulley keyed upon the shaft, II, and C is the pressure-ring axially movable, and connected with pulley, B, by the bolts, *a*. On the latter are placed the springs, *b*, which tend to engage the pressure-ring, C, with the double-cone, A, and thus to put the coupling in gear, and the tensioning thereof is effected by the washers, *c* and *d*. The disengaging or releasing-bolts, *e*, are screwed into the ring, C, and held fast in position by the guard-nuts, e^1. The bolts pass through holes in the coupling-pulley, B, so as to extend to the other side with a terminal part. Bolts, f^1, are located in lugs on the pulley, B. for the purpose of receiving the oscillating levers, *g*, provided with a cam, g^1. *h* is a disconnecting-sleeve, provided with pins, h^1, which latter are passed through slots, g^2, in the lower ends of the oscillating levers, *g*. In the rear part of the hub of the solid double-cone, A, are secured two studs, *i*, which pass through holes, i^1, in a ring, *k*, adjustably secured upon the shaft, I, and are provided with springs, *l*, which later can be regulated in tension by means of the nuts, l^1, so that when the coupling is out of gear the double-cone, A, is drawn back until it reaches the ring, *k*. The coupling is put out of gear by an axial outward displacement of the sleeve, *h*, whereby the cams, g^1, of the disengaging levers, *g*, push the bolts, *e*, backwards, so as to disengage the pressure-ring, C, from the double-cone, A.—January 24th, 1906.

Fig. 1.



23557. 16th November, 1905. Improvements in Internal Combustion Engines. Frederick H. Royce, Cooke Street, Hulme, Manchester. The subject of this invention is an improved arrangement of engine and of mechanism for the driving of the water and oil pumps. There are two figures. Fig. 1 is an end elevation. The cylinders, A A, are bolted to the crank case, B, in two rows radially to the crank shaft, Q, each set being inclined at 45 deg. to the vertical. The inlet and exhaust valve chambers, C, in the cylinders, A A, are arranged, so that the inlet and exhaust valves, D, work vertically. The valves, D, are operated by small tappet levers, E, which are themselves worked by cam shafts, F F. The cam shafts, F F, are driven from the crank shaft, Q, by means of gear wheels, R S T. The crank shaft, Q, and the cam shafts, F F, of which there are two, have their bearings complete in the top half of the crank case, B, so that the bottom half of the crank case, G, may be removed without disturbing the mechanism. Forced lubrication is provided for the crank shaft and cam shaft bearings. The crank pin brasses are lubricated by oil forced through holes drilled in the crank shaft. The supply is taken from the oil under pressure at the main bearings The pressure in the oil system is maintained by the pump, H. The two pumps, H J, for the circulation of oil and water respectively (which are of the gear-wheel type) are fixed to the bottom half of the crank case, G. A vertical shaft is driven from an intermediate wheel, S, by means of a pair of bevel wheels. The two shafts parallel to, and driven by this shaft through gear wheels form the drive for the two pumps.—January 24th, 1906.



Patent Specifications Published.

Applied for in 1904.

Published February 8th, 1906.

24,591. H. F. FULLAGAR. Governing intl. combn. engines of the turbine type.

Applied for in 1905.

Published February 8th, 1906.

761. C. A. FRANKLIN. Spring wheels.
869. M. H. VOIGT. Water-circulation devices for steam generators.
918. G. SPARKS AND F. S. E. BOOTHBY. Hydraulic clutches.
1,893. L. H. E. P. PERRY. Radiators.
10,701. AUTOMOBILES ADER. Rear-axle support and driving mechanism.
10,823. L. MELLOR. Tool for removing and replacing pneumatic tyres.
23,557. F. H. ROYCE. Intl. combn. engines.

Published February 15th, 1906.

1,561. W. GUNN. Spring frame for motor tri-cars.
3,378. I. S. MCGIEHAN. Cushion thrust hub for wheels.
4,234. C. RAINEY. Change-speed-gears.
4,517B. W. G. HAY. Steering wheels.
4,520. W. BAGSHAW AND W. H. MASSEY. Clutches.
4,82[illegible]. A. [illegible]LLTREE. Variable speed gear.
5,825. C. ELLIS. Manufacture of producer gas.
7,189. G. PILKINGTON. Frames and springs.
8,131. C. CHALLINER. Elastic tyres.
8,881. P. STINNER. Explosion turbine.
9,155. C. R. BULLARD AND I. WILDERSPIN. Non-skidding devices.
9,515. J. B. KING. Valves.
11,340. SIR W. G. ARMSTRONG, WHITWORTH AND CO., LTD., AND W. G. WILSON. Balancing the moving parts of engines.
14,063. H. A., &C., SULZER. Intl. combn. engines.
15,105. J. E. GIBBS AND F. H. SHEPPEE. Change speed mechanism.
15,840. F. REICH. Motor suspension and car frame.
17,166. E. GOLDFINGER AND A. KAULBACH. Automobile vehicles.
17,959. P. F. A. GILBERT. Automobile vehicle.
19,708. H. J. HUDSON AND R. J. HALLS. Variable speed gearing.
22,333. J. A. TORRENS. Vaporisers.
22,488. F. H. ROYCE. Steering gear.

The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

No 268. (No. 8, Vol. XI.)] FEBRUARY 24TH, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.

Photo by R. J. Mecredy.

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DIARY OF FORTHCOMING EVENTS.

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British Events.

Feb. 23-Mar. 3.	†Manchester Motor Show (St. James's Hall).
March 1 ...	*4,000 Miles Tyre Trials.
March 1 ...	*Lamp Trials.
March 1 ...	*Speedometer Trials.
March 8 ...	A.C.G.B.I. General Meeting.
March 2-10 ..	†Sheffield Motor Show.
March 9-17...	†Glasgow Motor Car Show.
March 24-31	Cordingley and Co.'s Motor Show.
May 26 ...	Motor Union Meeting (Birmingham).
June 11-16 ...	Lands End to John O'Groat's (Auto Cycle Club).
June 13-16 ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July 21	Motor Union Meeting (Bath).
Aug. ...	*Van Trials.
Sept. 22 ...	Motor Union Meeting (York).
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

Feb. 19-25 ...	Paris Voiturettes and Tri-car Trial (*Les Sports*).
March 15-18	Vienna Motor Exhibition (A.C. of Austria).
March 25-31	Nice week.
April 1-15 ...	Monaco Motor Boat Exhibition and Races.
April 1-17 ...	Budapest Exhibition (A.C. of Hungary).
April-May ...	Milan Exhibition.
April ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 13-14 ...	Tour de France (Motor Cycles and Voiturettes).
June 6-13 ...	Herkomer Cup.
June 28-29 ...	Kiel Motor Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14-17 ...	Ostende Meeting.
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15-16 ...	Mont Ventoux Hill-Climb.

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* Automobile Club of Great Britain and Ireland Events and Papers.

† Members of the Motor Union are admitted free to these Exhibitions on presentation of their cards of membership.

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PASSING EVENTS.

A Determined Onslaught on Dust.

We are glad to be able to announce the imminence of what we trust will prove to be the most determined and instructive onslaught upon the dust-fiend which we have yet seen. A joint committee of the Roads Improvement Association and the Automobile Mutual Protection Association are arranging to subject portions of the Maidstone Road between Wrotham and Maidstone to treatment with various anti-dust road-making materials. No mere palliatives are to be employed, but lengths of 500 yards of the road are to be made up as if the road were being mended in the ordinary fashion with representative materials which, there is reason to believe, really make a road in which the formation of dust, if not an impossibility, is reduced to a minimum. Three types of materials are to be experimented with. These are:—

1. "Tar-Mac," a preparation to which we have frequently alluded in previous numbers of the Journal. The Tar-Mac to be employed on the Maidstone Road is to consist of blast furnace slag, broken to the size of ordinary rather small road metal, and impregnated with tar when hot. The blast furnace slag is of very special degree of hardness, being that obtained from blast furnaces when producing very grey pig-iron such as is employed for making steel in the Bessemer converter.

2. "Quarrite." This is a patented preparation in which crushed limestone replaces the blast furnace slag in the Tar-Mac, being similarly treated with tar when hot. It is understood that a special point in employing this material is the selection of proper proportions of various-sized material.

3. "Kleinpflaster." This is a method of road treatment to which we referred recently, and consists in facing the ordinary surface of the road when well and carefully made up, with small rectangular blocks of granite cut out by a special machine. The sets are said to wear smooth and produce a good surface in course of time.

The Tar-Mac, as our readers know, has already been tried with good results in London, Nottingham, and elsewhere; the Quarrite was used, and is said to have given satisfaction, on the Blackpool Promenade, and the Kleinpflaster is employed, it is alleged, with success in various parts of Germany. Of course, the Joint Committee may be relied upon to give fair treatment to the three competing preparations. It would, obviously, not be a fair test to put 500 yards of one material where the road goes through a damp and shady valley, and 500 yards of another on an exposed sunny hillside like Wrotham Hill. We think, too, that it would certainly be wise not to lay the specially-prepared stretches quite close together, for it would be a pity if anything were allowed to favour one type of material more than another. It would at any rate reduce this risk if short lengths of ordinary road were left between them. The great object of the experiment is to provide data on which local authorities responsible for highway maintenance will feel they can fully rely. The Maidstone Road is one of the roads out of London on which traffic is most severe, owing, amongst other things, to the large amount of agricultural produce brought up by wagons, lurries, and traction engines, to the markets of the Metropolis, and, in fact, the general opinion seems to prevail, with much justice, that road material that will stand on this road will stand anywhere, while if it will not get dusty in the neighbourhood of Maidstone, it will have proved its capacity for vanquishing the dust fiend on any highway in the British Islands. We sincerely trust that the experiments will be satisfactory. The chief obstacle to the adoption by local authorities of Tar-Mac and other permanent cures for dust is the initial expense. If, however, it can be proved that this greater initial cost is, as we believe is the case, more than counterbalanced by a subsequent economy, and that instead of spending more of the ratepayers' money to secure dustlessness they will in the end be economising it, we think that great desideratum of every member of the community (at any rate, of all who live along the sides of roads in the country or in country villages)—the dustless road—will become a reality before very long.

◆ ◆ ◆

To Stop 'Bus Racing.

The Vanguard omnibuses, the first effective line of motor 'buses on the London streets, had not been long catering for the traffic of the Metropolis, when a rival service was started in more or less direct opposition to them. We entertained at the time—and expressed—a good deal of dread that we should see a repetition, on motor 'bus lines, of the dangerous farce which, when enacted by horsed omnibuses a good many years ago, made London streets both a danger and a laughing-stock to their users, and the subject of mockery in Continental papers. We refer, of course, to the tactics adopted by the more powerful companies of what is politely termed "running their rivals off the road." The method employed was barbaric in its simplicity. Two 'buses of the stronger company were told off to "nurse" each of the 'buses of the new company which was selected as a victim. One of these made it its business to arrive at every important corner first so as to pick up the waiting passengers, the other followed closely behind so as to pick up any that happened to be left. In this way the receipts of the new competitor were effectively diminished, partly because the other 'buses picked up the people who would otherwise naturally have become its passengers, and partly because all who were not gifted with a strong sporting instinct and nerves of steel were disinclined to adventure their necks in these encounters which, though often humorous, were frequently waged with almost gladiatorial ferocity. As to arrive at a given point first on all occasions was an essential element in the game, racing resulted, and drivers and conductors joined in it with absolute delight. We have already pointed out, as above mentioned, that dangerous and bad as this sort of thing was with a horsed omnibus, it would be far more dangerous both to passengers and other users of the streets if adopted by motor 'buses.

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The Recrudescence of an old Evil.

So far things have gone along fairly smoothly, but already symptoms of the old evil in an exaggerated motor 'bus form, are becoming apparent, as travellers in the Metropolis must have already noticed, and complaints are beginning to appear on the subject in the daily Press. The competing 'bus companies, or their managers, naturally enough, disclaim all responsibility, insinuate that the trouble is due to the natural sporting instincts of rival drivers, and explain that their yards are fairly plastered with notices announcing all kinds of awful penalties against drivers who ever give way to temptation, and indulge in "point to point" steeplechases of the kind referred to. They used to say much the same thing in the old days of horsed 'bus racing, although even then their denial met with almost universal scepticism. At any rate it was not the drivers or conductors who arranged for two 'buses to accompany a single 'bus belonging to the rival company. Possibly they were told not to race, as a certain assembly was once advised not to nail a certain ear to a certain pump, and the present disavowals of the present companies are no doubt just as sincere as the former ones. But in any case it is a very remarkable coincidence that on one particular line at any rate, one motor 'bus belonging to one company is almost invariably seen with two motor 'buses belonging to another company in close attendance (in front and behind) upon it, while this apparition is followed by a 'busless interval varying very often from ten minutes to a quarter of an hour.

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Must be Stopped with a Ruthless Hand.

We say again, that any attempts to introduce among motor 'buses this preposterous misuse of the streets should be repressed at once by the police with a firm hand. They had difficulties in the old days with the horsed 'buses, for they could do nothing but summon drivers and conductors, the penalties imposed were trifling, and were probably not really paid by the drivers and conductors actually fined. The police will have to adopt some more drastic method in the present case, for the danger is a serious one, while the injury that will result to the development of the motor 'bus and the impediments that will be placed in the way of the gradual motorization of our street traffic will be incalculable. We presume the police possess adequate powers. If their powers are found not to be adequate, they should be intensified by legislation at the earliest possible moment. Dangerous nonsense of this kind *must be stopped!*

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Using the Engine as a Brake.

Very considerable thanks are due to Dr. Watson for the valuable paper which he read before the Automobile Club, last week, on the subject of employing the engine on an ordinary petrol car instead of an ordinary brake, for retarding the vehicle. In this paper, which we reproduce on another page, he has handled the question with a degree of thoroughness and a degree of suggestiveness which has never before been accorded to it, and if any confirmation of this statement were needed, it is provided by the remarks of Mr. Dugald Clerk, who, in opening the discussion, pointed out that the high degree of accuracy which Dr. Watson had succeeded in obtaining, had enabled us to learn what we had never before known with so great an approach to exactness—the real efficiency of the small petrol engine—a valuable result due to Dr. Watson's exceptionally skilful manipulation of the manograph.

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What the Braking Effect can amount to.

The most interesting features of Dr. Watson's paper are those in which he contrasts the braking power of an ordinary petrol engine with what it might become with a slight alteration in the valve mechanism, and the definite figures which he gives in each instance. Thus we learn that with an ordinary engine the maximum braking effect is some 33 per cent. of the power of the engine, yet by the introduction of special mechanism for causing the pistons to compress air during each backward stroke, and to then allow the air to escape to atmosphere, as much as 65 per cent. of the engine power can be obtained for braking purposes. On a car, however, it might actually be made even greater than 65 per cent., because the transmission losses should be added to the brake effect, whereas they have to be deducted from the engine power. Taking these losses as being 15 per cent, Dr. Watson estimated the maximum braking effect at 88 per cent. of the maximum engine power.

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How Far it is Wise to Apply it in Practice.

Dr. Watson did not express any personal opinion as to whether it was wise so to use an engine on a car or not. In the discussion that followed, however, the general view was apparently all in favour of adopting such a course, and none of the speakers alluded to the decided disadvantages that exist, on mechanical grounds. Now it seems to us that the transmission losses on a car represent useless strains and stresses in the driving mechanism, strains and stresses, in fact, which are tending to disintegrate it, and ultimately reduce its strength. The moving parts, moreover, are usually subjected to strains in one direction only, whereas if the engine is used as a powerful brake the direction of strain would be constantly alternated, and the various shafts, bearings, and gear-wheels would receive a most injurious racking motion. Further than this, the heavy fly-wheel on the high-speed engine-shaft tends to prevent sudden variations of speed at that end of the mechanism, and consequently abnormally severe shearing and twisting strains—far in excess of those which the engine normally exercises—may be imposed on the transmission mechanism by using the engine as a brake. In the case of ordinary touring cars, it is quite possible that this may not be found to do a great deal of harm, their total weight is so comparatively small, and the gear-ratio between the engine and the wheels is so moderate that their longevity may quite possibly not be seriously impaired thereby.

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Not to be Commended for Commercial Vehicles.

It is quite a different matter, however, with commercial vehicles which carry heavy loads, and are geared very low, and we therefore take very serious exception to the enthusiastic proposals put forward at the discussion to employ the engine as a brake in the case of petrol lurries and 'buses. In such cases, the racking action on the transmission mechanism would be so enormous and so serious, if the engine were habitually used instead of the ordinary brakes, that we do not believe any transmission-gear would stand it for very long. To kill the transmission-gear for the sake of effecting economy in brake-blocks is certainly not a very rational proceeding, as the cost of one new transmission-gear would provide the motor 'bus with brake-blocks and brake-drums until the present drivers had retired by superannuation. Dr. Watson's paper is of the highest value as showing what braking effect *can* be obtained from the engine, but it would, we think, be a thousand pities if it were to induce builders of heavy vehicles, lurries and motor 'buses to adopt the principle involved before fully weighing all the *cons* as well as the *pros*. It is only an idea, but we should not be at all surprised if it were even found advisable in the future to introduce some type of free-wheel clutch between the transmission-gear and the driving road-wheels, with the express object of checking all tendencies for the car to drive the propelling mechanism.

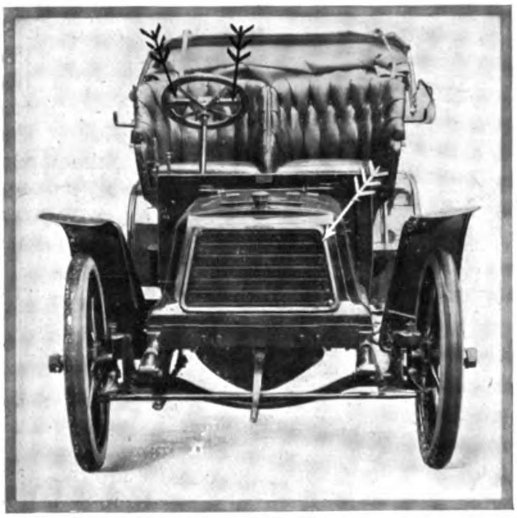
How to Recognise the Cars of To-day.

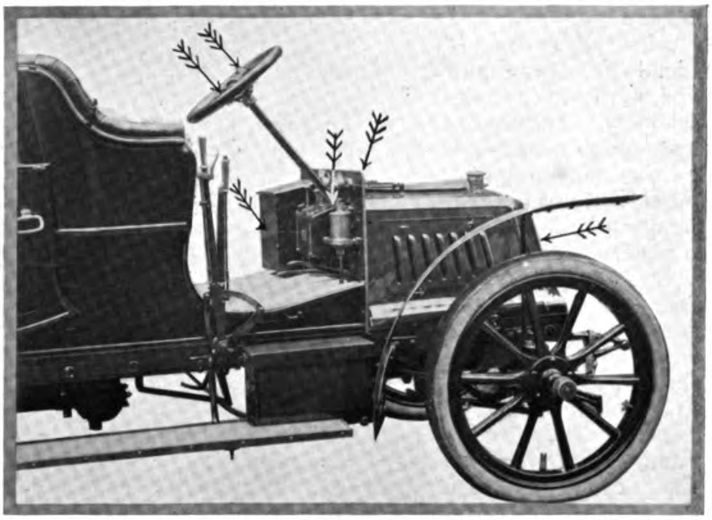
(No. 5).

The Panhard.

(FRENCH)

8-11, 15-20, 24-30 & 35 H.P.





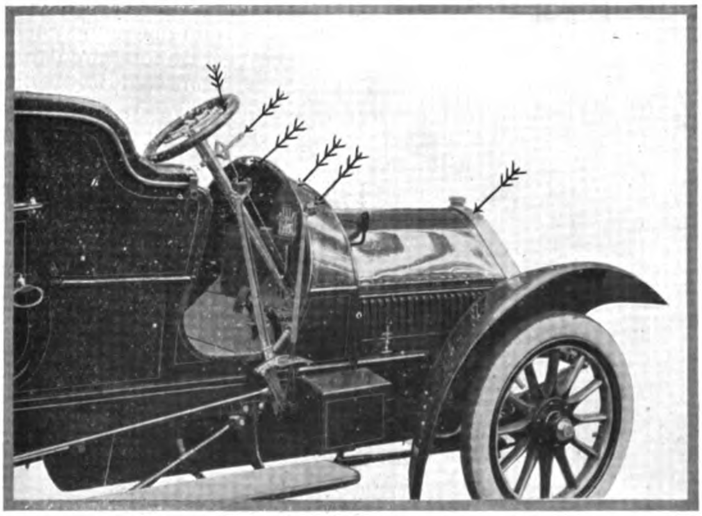
The two smallest models have their RADIATORS formed by finned, horizontal tubes set in a neat framework, but boneycomb radiators of different shapes are fitted on the more powerful cars. On the LOW, STRAIGHT DASH is a wooden BOX containing the MAGNETO, and the STEERING PILLAR passes through the dash-board. All Panhards have a special type of HAND-CONTROL above and across the STEERING-WHEEL.

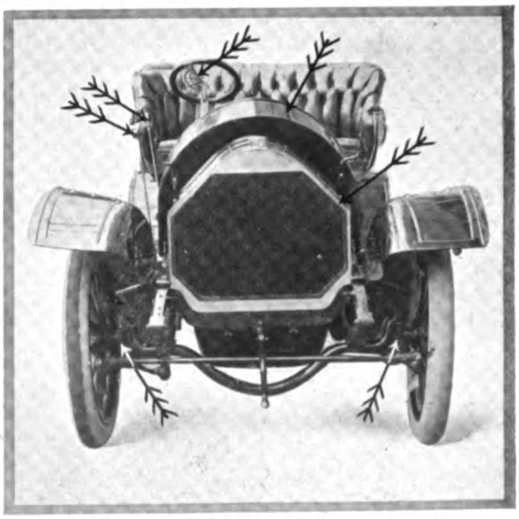
(No. 6).

The Humber.

(BRITISH)

10-12 H.P. & 16-20 H.P.





Both models have RADIATORS AND BONNETS of this distinctive shape, but vertical, finned tubes are used in place of the honeycomb on the smaller. The larger only has the unique CAB-DASH, the forwardly inclined KNOBS ON THE SIDE LEVERS, and the small auxiliary-air HAND-LEVER projecting from the STEERING-PILLAR. All Humber cars have ONE-ARMED STEERING WHEELS. Note the outwardly SLOPING STEERING-HEADS at the ends of the front axle.

THE 16-H.P. CRAWSHAY-WILLIAMS PETROL CAR.

Among the new British firms who first brought their cars before the public at Olympia, in November last, was Messrs. Crawshay-Williams, of the Ashtead Motor Works, in Surrey. They have for some time devoted their attention to the production of touring cars of moderate power, and have also made a study of light vans for delivery work, their standard models at present consisting of a 4-cylinder vehicle of 16-h.p. for pleasure purposes, and a twin-cylinder chassis suitable for taking any type of light commercial body. In general design, both models follow the same lines, having side chains to drive the rear wheels, but it is to a consideration of the touring car that we propose to confine our attention in this article.

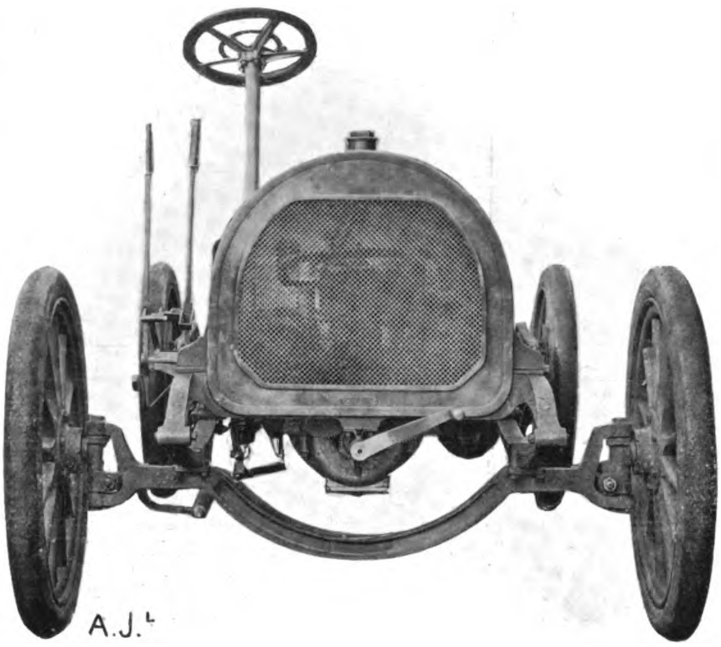


Fig. 1.—Front view of the 16-h.p. Crawshay-Williams Car.

So clearly do our photographs show the arrangement of the various parts, that comparatively little need be said concerning the 16-h.p. chassis as a whole. Fig. 1, for instance, which is a front view — and actually enables the outline of the engine to be seen through the honeycomb radiator—gives an excellent idea of the shape of the radiator and of the forged front axle with its steering-heads; the two steering-heads are fitted with ball-thrust-bearings to take the weight of the car, the stub-axles on which the wheels revolve, have ball-bearings, and the cross-rod that ties the two steering-heads together lies behind the axle, as seen in Fig. 4. Similarly, in Fig. 2, which is a view from the "near" side, it will be noticed that the tapering side-members of the pressed-steel frame present a level surface on the upper side, that the exhaust box is fixed close up, almost midway between the front and rear wheels, and that the chains which drive the rear wheels are kept comparatively short owing to the position of the gear-box. Figs. 3 and 4, which are views from above and beneath, respectively, still further serve to demonstrate the form of construction adopted, both indicating the manner in which the side-members of the frame curve inwards in front, besides showing the short underframe that supports the clutch-gear as well as the engine. These views, in conjunction with Fig. 5—which is taken from an elevated position at the rear of the chassis—show the large (13½-gallon) corrugated petrol tank fixed beneath the frame at the back, and also enable the arrangement of the long semi-elliptic springs to be seen. In Figs. 5 and 6, the upper portion of the gear-box has been removed, and the latter view in particular gives an excellent idea of the change-speed-mechanism enclosed in it. Fig. 6 represents the central portion of the chassis, as seen from above.

The main features of the chassis are the very substantial pressed-steel frame, with its three intermediate transverse members, the Hele-Shaw multiple-disc clutch, with a special cam-action for controlling it, the strongly-built change-speed-gear, with a somewhat original operating mechanism, and the internal brakes that act upon the hubs of the rear wheels.

On the chassis from which our photographs were taken, the engine is of the well-known Simms type, the cylinders having a bore of 95 mm, with a stroke of 110 mm. It is fitted with a low-tension magneto system, and has, combined with it, a gear-driven circulating pump of the centrifugal type. An automatic governor acts direct upon a butterfly throttle-valve in the induction-pipe, but the valve is also subject to the control of one of the small hand-levers that lie above the steering-wheel. The other small lever is connected with the "timing-gear" for the ignition, and both levers work about the same circular quadrant. These levers have quick-thread screws formed upon their sleeves, to give

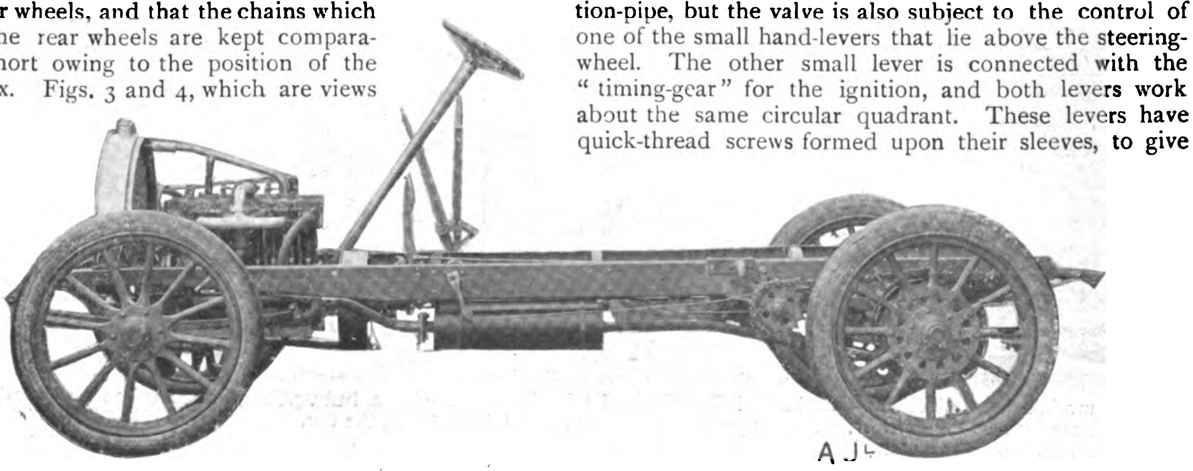


Fig. 2.—View of the 16-h.p. Crawshay-Williams Chassis from the "near" side.

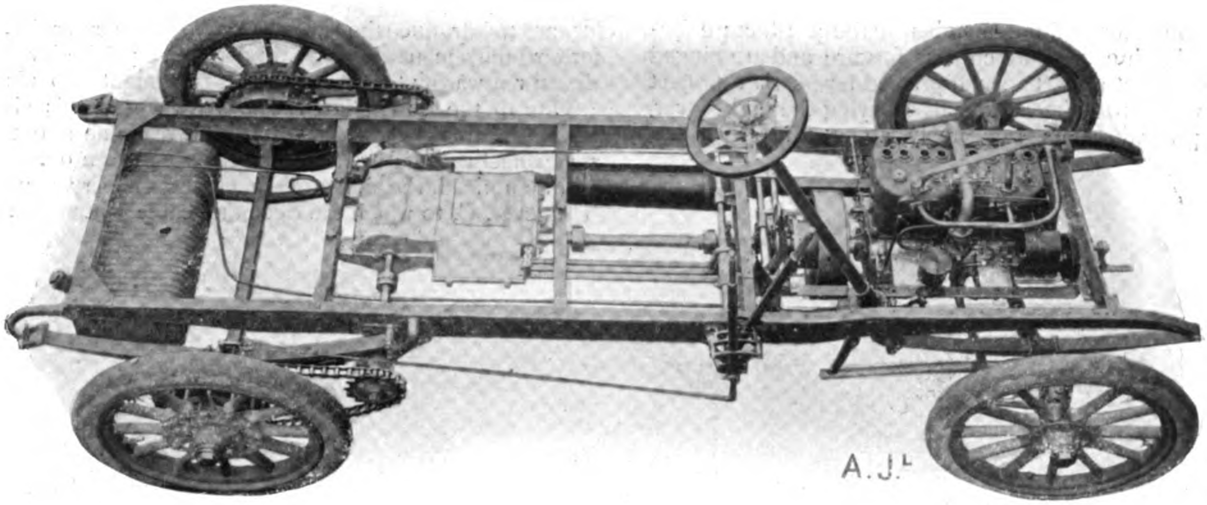


Fig. 3.—The 16-h.p. Crawshay-Williams Chassis, as seen from above.

the necessary up and down motion to the steel cords that pass to the throttle-valve, and to the timing-gear.

For operating the clutch, there are two rock-shafts fitted across the underframe, one of these shafts carrying the clutch-pedal, while the other carries the fork that engages with the sliding portion of the clutch itself. The former shaft is fitted with a cam that engages with a roller on the other shaft, and this roller is provided with an adjustment screw, B (see Fig. 6), for regulating the extent to which its shaft is rocked by the cam. By this arrangement, the pedal is made to withdraw the clutch immediately it is depressed, but the cam merely holds the clutch out of engagement, and so relieves the pedal of any pressure from the clutch-spring when the pedal is further pressed downwards by the driver. Similarly, it may be pointed out that a further advantage is gained owing to the facility with which the pedal can be adjusted relatively to the clutch itself. As will be seen in Fig. 4, the clutch-shaft is supported by a bearing fixed to the frame just behind the operating-mechanism, and there is a flexibly-coupled longitudinal shaft to connect the clutch-shaft with the change-speed-gear. Interconnected with the clutch mechanism is the brake-pedal, so that the clutch is automatically thrown out of action when the foot-brake (on the differential countershaft) is applied; the hand-brake, however, acts quite independently of the clutch.

All three shafts in the gear-box are provided with ball-bearings, which are secured to the lower casting by straps (as seen in Fig. 6), and, therefore, the upper portion of the box can be completely removed without disturbing them. There are, however, inspection doors as well, so that it is not necessary to take off the entire casting in order to make a cursory examination of the mechanism. The lower casting is fixed by a single bolt to the cross-member in front of it, and by two bolts to that immediately behind it, so that it is unaffected by any twisting of the frame. With the same object, flexible couplings are introduced in both halves of the differential countershaft, the ends of which are carried by long plain bearings in much the usual way. The gear itself, which provides three forward speeds and a "reverse," is of that type in which two sliding sleeves are mounted upon the first-motion-shaft, and an intermediate pinion is mounted beneath, so that it can be moved along its shaft. To the left of the first-motion-shaft is the second-motion-shaft (carrying three spur-wheels), and the bevel-pinion for driving the differential

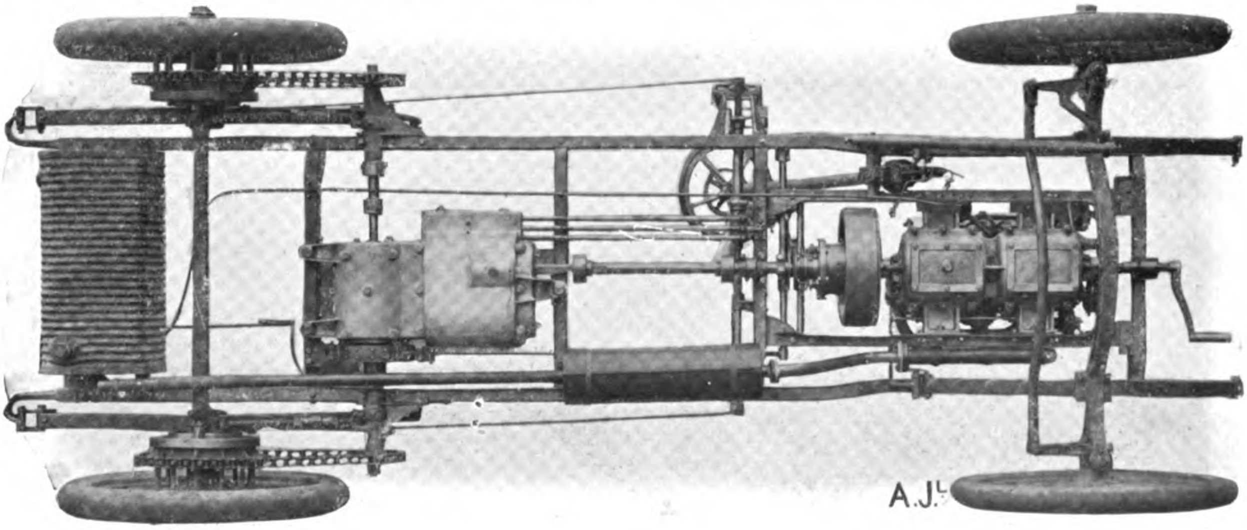


Fig. 4.—View of the 16-h.p. Crawshay-Williams Chassis from beneath.

gear. These three sliding-members in the gear-box are controlled by three rods which pass forward and are hinged at their front ends to small pivoted levers that project downward from the rock-shaft carrying the brake-lever. The pivoted levers ride freely about this shaft, but either of them can be engaged by the horse-shoe shaped carrier, A, which is fitted to the change-speed-lever, and thus whichever gear is required can be introduced. A special arrangement is made for preventing the first-speed gear-wheel from moving sideways when the "reversing" pinion is being slid into mesh with it, and —as our illustrations clearly indicate—the gear-lever works in a quadrant of the 3-slotted "gate" type. In the inner slot—into which the lever can only be moved after the safety-catch has been liberated—a forward motion gives the reverse; in the central slot, the lever has to be pressed forward to introduce the first speed; and in the outer slot, a forward movement gives the third speed, or if the lever is drawn rearwardly the second speed is brought into play.

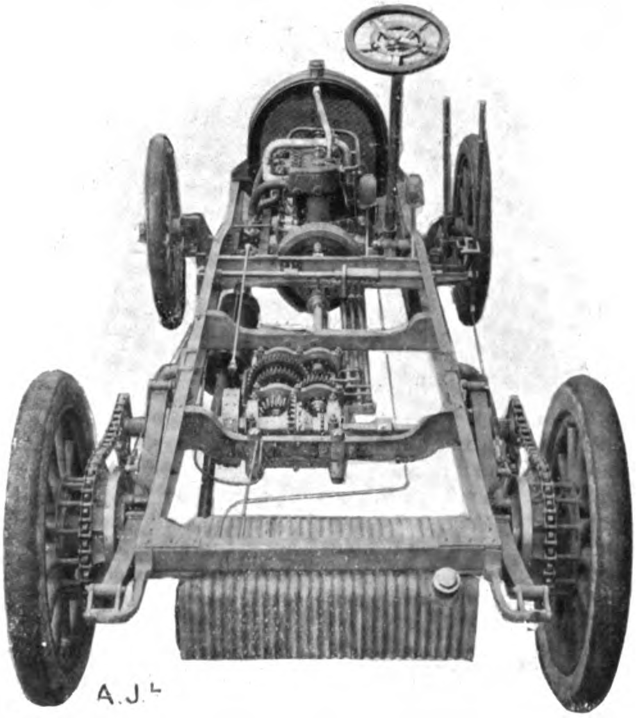


Fig. 5.—Rear view of the 16-h.p. Crawshay-Williams Chassis.

One of the hub-brakes is shown in Fig 7, this view having been taken from the end of the rear-axle, after the road-wheel with its brake-drum had been taken off. As will be noticed, the actuating mechanism is very simple. The lever, C, to which the operating cable is attached, is mounted upon the same rock-shaft as the specially-shaped cam, C^1, and, pressing against this cam, are small rollers mounted on the ends of the two brake-shoes, C^2. The shoes are pivoted to the pin, C^3, at their lower ends, and are normally held clear of the surrounding brake-drum by the spring, C^4, the cam, C^1, forcing them apart when it is rocked about its axis.

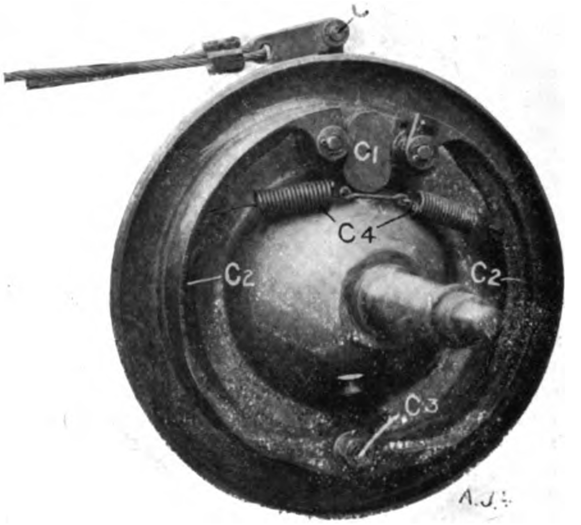


Fig. 7.—One of the external expanding hub-brakes on the Crawshay-Williams Chassis.

The standard 16-h.p. chassis has a wheel-base of 8 ft. 8 in., a track of 4 ft. 7 in., and the front and rear tyres are 870 mm. by 90 mm. and 875 mm. by 105 mm. respectively.

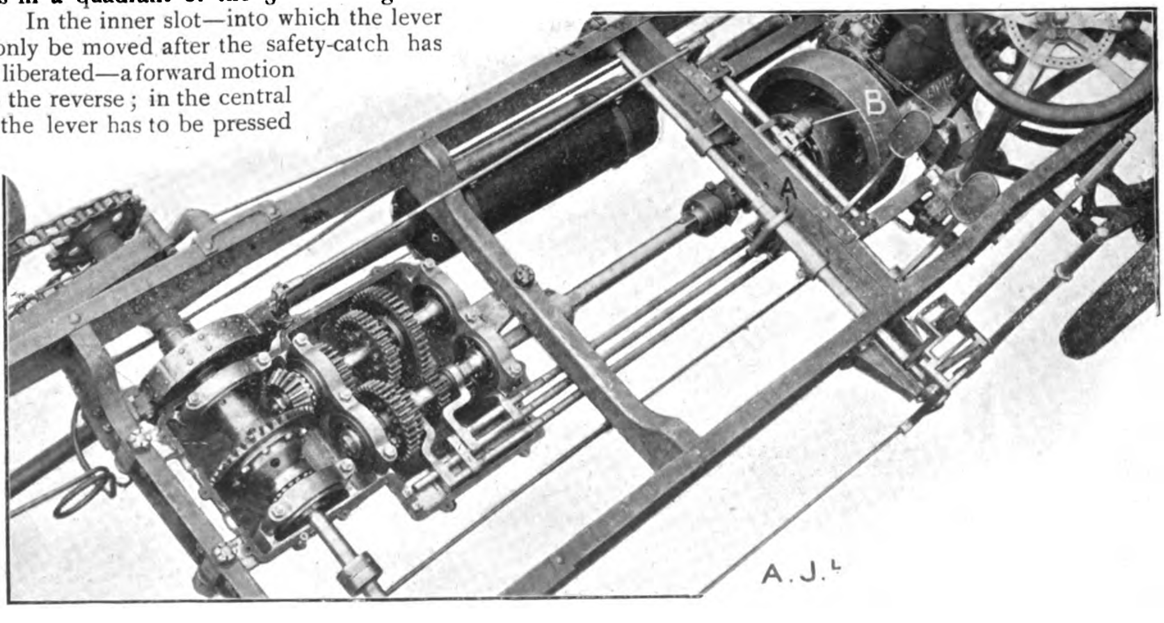


Fig. 6.—The central portion of the 16-h.p. Crawshay-Williams Chassis, as seen from above, showing the gear-box with the upper half removed.

THE WESTMACOTT PARAFFIN VAPORISER.

PARTICULARLY for marine work, there is an ever increasing demand—which has unfortunately not hitherto been altogether satisfied—for a thoroughly satisfactory vaporiser whereby ordinary lamp-oil can be substituted for petrol with internal combustion engines, and, as is well known, a large number of makers and inventors are busily engaged in attempting to solve what has for some years proved to be an exceedingly tough problem. Amongst the many devices of this kind which have been more or less recently introduced, is that which was fitted by Messrs. Woodnutt and Co. to the boat they ran in the Reliability Trials at Southampton this year; and it is of this vaporiser—the invention of Mr. Alfred Westmacott—that we are now able to give full particulars.

It is of that type in which the oil is drawn up through a mixing-chamber by the main volume of the entering air, and in which the mixture thus formed is caused to pass through a heated chamber before being led to the induction-valves of the engine. It also has means provided by which the flow of oil can be directly adjusted, and is fitted with a spring-loaded valve which tends to maintain an approximately constant richness of the mixture, in spite of varying load, by admitting a greater or less quantity of auxiliary air into the induction-pipe between the vaporiser proper and the throttle-valve.

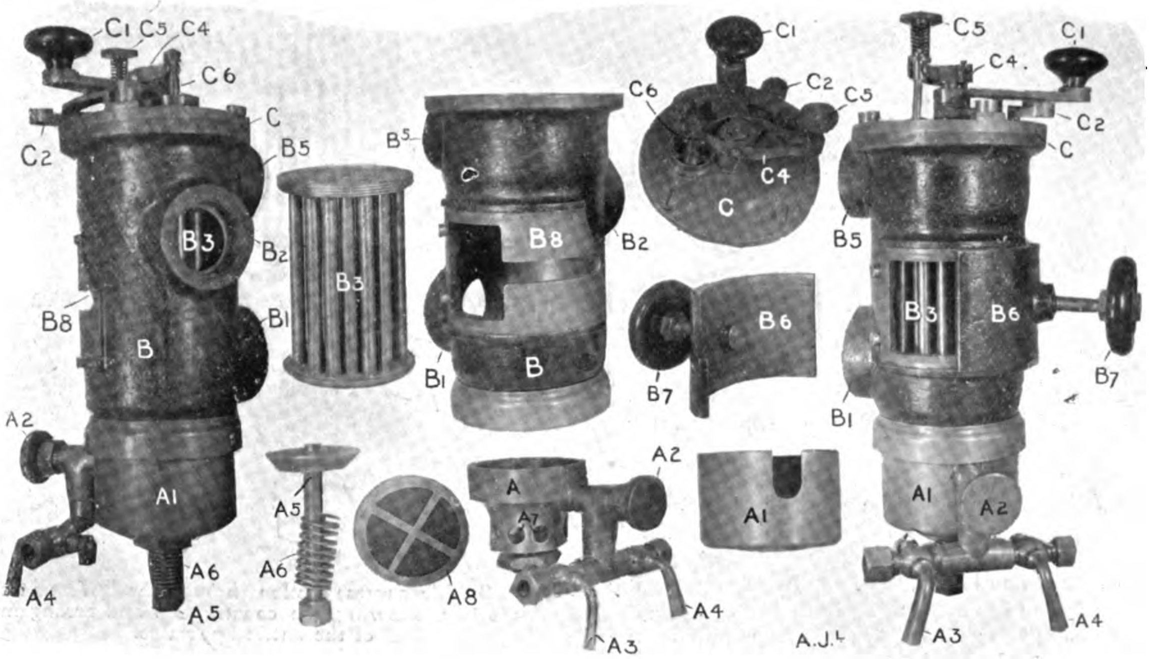


Fig. 1.—Two views of the complete "Westmacott" Vaporiser, with other views showing some of the more important component parts grouped between them.

In Fig. 1 the entire apparatus, both complete and in parts, is shown, from different points of view, in such a way that its construction is rendered almost self-evident, while in Fig. 2 we give a couple of additional views of the throttle-valve with the auxiliary air-valve; in Fig. 3 is a transverse section of the entire mechanism. Referring to these illustrations, it will be seen that there is a lower valve chamber, A, an intermediate heating-chamber, B, and that the engine regulating-valves are carried above by the cover-plate, C. Inside the valve-chamber, A, is the atmospherically-operated valve, A^5, which is normally held down upon its seat by the adjustable external spring, A^6, and this valve not only controls the passage of the main air supply entering through the ports, A^7, but also prevents the oil from flowing into the valve-chamber. For this latter purpose the oil is led to a hole drilled through the seating of the valve, and the needle-valve, A^2, which regulates the flow, is arranged close up to the seating. The valve, A^5, is of course lifted off its seat by the suction of the engine, when running, and the air and oil are then simultaneously drawn up into the heating-chamber, B, where the former is actually vaporised.

Around the valve-chamber, A, there is a light metal casing, A^1, to prevent any water from finding its way down to the air ports, A^7, in rough weather; and immediately above the valve, A^5, there is a mixing-ring, A^8, having conical steps turned around its interior, as seen in Fig. 3, and several layers of wire gauze fitted right across the top of it (see Fig. 1). This portion, A^8, serves as a mixing device for bringing the oil and air intimately into contact with one another.

The heating-chamber, B, forms a kind of exhaust-gas jacket, inside which is fitted a group of small tubes, B^3, these tubes being arranged like those in an ordinary fire-tube boiler. The tubes with their end plates form a single, and separately detachable, unit, which can at any time be screwed up out of the casting, B, and removed for cleaning. The upper plate has a screw thread for this purpose, while the lower one is provided with a conical valve-seating that makes a gas-tight joint with the main casting. When the tubes are in place, the whole of the explosive mixture is compelled to pass up through them into the upper chamber, B^4, and, all around the tubes, are led hot exhaust-gases from the engine. The exhaust-pipe enters the casting, B, at B^1, and the outlet-pipe is connected at B^2.

When the engine is running, the tubes, B^3, are at all times kept hot by the exhaust-gases alone, but when it is desired to start the engine initially with paraffin, it is necessary to heat them up at first with a blow lamp. For this purpose, there is an easily opened door, B^6, fitted in the side of the chamber, B, and this is normally locked in place by the hand screw, B^7, the inner end of which rides in the slot, B^8. A start can, however, be made from cold, by using petrol for a short time before turning on the paraffin, and it is for this reason that the two cocks, A^3 and A^4, are provided in conjunction with the needle-valve, A^2.

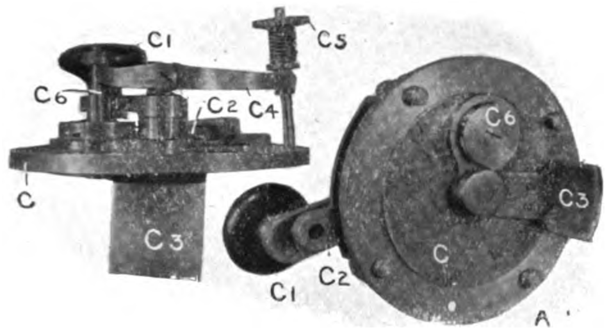


Fig. 2.—Side view, and a view from beneath, of the throttle-valve, C^3, and the auxiliary-air-valve on the "Westmacott" Vaporiser.

For regulating the speed of the engine, a throttle-valve of very simple construction is employed, this merely consisting of the shutter, C^3, which can either be controlled by the hand-lever, C^1, or by an automatic governor acting on the lever, C^2. Both levers have the effect of causing the shutter, C^3, to open or close the passage of the mixture from the chamber, B^4 to the induction-pipe, B^5, for both these levers are fixed to the spindle that carries the shutter. A special arrangement, however, is made by which the action of the auxiliary-air-valve, C^6, is modified to suit various positions of the throttle. To this end, a quick acting thread is cut on the spindle of the throttle-valve, and pivoted to the nut riding on this thread, is the lever, C^4, that is interposed between the adjustable spring, C^5, and the auxiliary-air-valve, C^6. The spring, C^5, at all times tends to keep the valve, C^6, upon its seat, but the strength of this spring is automatically varied by the screw thread above referred to.

It is in this form that the Westmacott vaporiser is at present manufactured for use with marine motors, and it appears to be giving very great satisfaction on those engines to which it has been applied. Approximately it gives a fuel consumption of about ·78 pint per b.h.p. hour, on an engine developing about 18 h.p. We understand that, although every facility has been made for readily cleansing the tubes, B^3, it is seldom necessary to do so in practice.

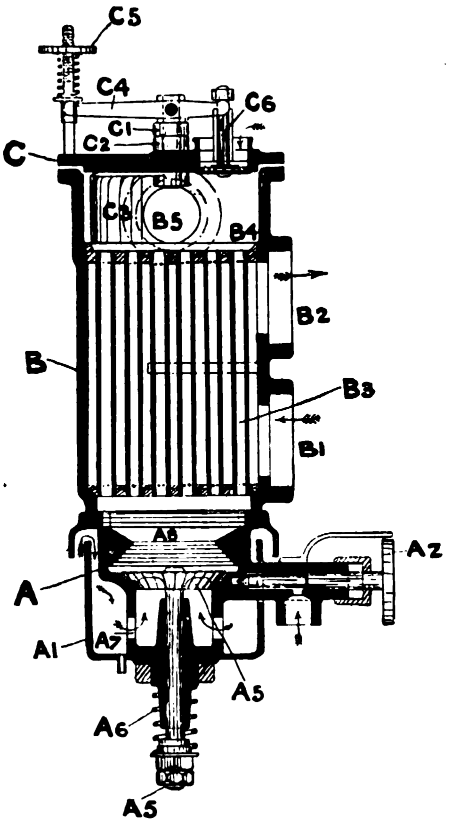


Fig. 3.—Transverse section through the "Westmacott," Vaporiser, showing the construction and arrangement of the entire apparatus.

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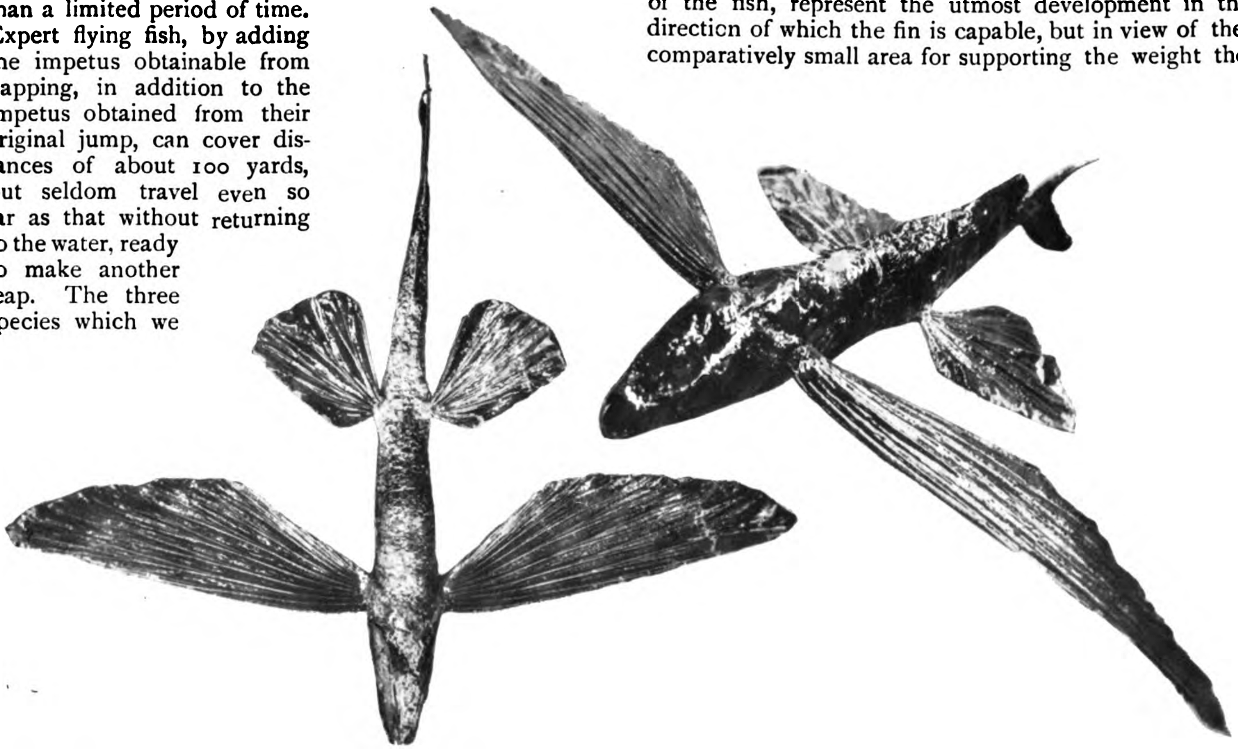
When no Obstruction is an Obstruction.

It has now been held by a Metropolitan magistrate that you may create an obstruction though nothing is obstructed. Formerly, and we believe even still by the great majority of magistrates, it was held that if a vehicle of any kind is drawn up at the kerb obstruction to other traffic must be proved to support the summons for obstruction. But Mr. A. W. S. Aldridge was summoned at the South-Western Police Court for allowing his motor car to stand for 2¾ hours outside his house in Conyers Road. In the hearing of the case the constable for the prosecution disclosed the interesting information that cabmen were usually allowed three-quarters of an hour before being summoned. He admitted at the same time that no traffic and no passengers were obstructed, but Mr. Grey nevertheless found Mr. Aldridge guilty of a technical offence. Of course to permit motor cars to stand in front of their owner's house for unlimited periods would be liable to abuse, but we still think there should be evidence of someone being inconvenienced or obstructed, before punishment of even a mere formal kind like the *1s.* fine and *2s.* costs which Mr. Grey ordered in this case, should be imposed. There are streets in the suburbs with only one or two houses in them. Surely a motor car standing in one of these for a whole day, or a whole week, would be doing no one the slightest injury.

AERONAUTICS.

Flying Fish as Instructors.

ACTING upon a suggestion made to us by Mr. A. V. Roe, whose aeroplane model, based upon the Wrights' aeroplane, we illustrated a week or two ago, we this week produce some photographs of flying fish, which may be said to some extent, at any rate, to have solved the problem of gliding. There are a number of different species of flying fish. It is a fish that has developed its fins into aeroplanes, with which it can accomplish (by jumping out of the water) extended glides, and even prolong these glides to a certain extent by flapping. But the flying fish is not really a flyer, in the sense in which the bird or the bat are flyers, for he cannot keep himself in the air for more than a limited period of time. Expert flying fish, by adding the impetus obtainable from flapping, in addition to the impetus obtained from their original jump, can cover distances of about 100 yards, but seldom travel even so far as that without returning to the water, ready to make another leap. The three species which we illustrate—thanks largely to the very great courtesy of Dr. Ridewood, who gave us every facility for taking our photographs at the Natural History Museum, South Kensington—are the *Exocoetus Lineatus*, captured off St. Vincent, in the Cape Verd Islands (two views, one from beneath, one from above); the *Exocoetus Cahiensis*, found in the Atlantic Ocean; and the *Exocoetus Spilapterus*, found in the Indian Ocean.



Views—showing the upper part diagonally, and the underside squarely—of a Flying Fish (Exocoetus Lineatus) found off St. Vincent, Cape Verd Islands. Our photographs—taken at the Natural History Museum, South Kensington, with the kind assistance of Dr. Ridewood—clearly show the two sets of "wings," or aeroplanes, that enable this curious type of fish to "glide" a considerable distance above the surface of the water. This fish is 19 in. long, and measures 21¼ in. from tip to tip of the "wings."

An interesting feature is that in addition to the two large aeroplanes or wings in front, which are designed evidently to carry the bulk of the weight (but which are too far forward to give an effective balance), smaller aeroplanes towards the tail are added. They are, however, much shorter and smaller in size, and the arrangement of the whole suggests that the weight of the fish is hardly properly distributed between the aeroplanes. This may, perhaps, to some extent explain the shortness of flight accomplished. But it is encouraging for human experimenters to be reminded of the fact that not only have birds, which are a race to themselves, accomplished flight, but that the same problem has also been solved by the bats, which are mammals, while in addition to these two successful aeronauts we have the flying fish.

When we consider the purely gliding action of the flying fish, the careful observation of his "wings" becomes a subject of keen interest. It will be noticed that they are very flat, straight, rigid, and hardly at all domed. In this respect they differ entirely from the feathered wings of all long-distance flying birds, which are curved upwards and inwards in front in a marked degree. Probably the "wings," if they can be so called, of the fish, represent the utmost development in that direction of which the fin is capable, but in view of their comparatively small area for supporting the weight they have to carry, a flying fish may claim to rank as a decidedly efficient "glider."

A Spanish Airship.

THE Lebaudy people are going ahead, as we chronicled last week, and now we are threatened with an apparition of another airship on the Lebaudy lines, designed by Capt. Kindelan for the Spanish Government. A good deal of secrecy is being maintained about the new airship, but it is understood that the envelope will be constructed of caoutchouc tissue, like the Lebaudy airship, will have a length of 35 metres and a diameter of 6 metres, and in this respect will be of about the same size as Santos Dumont's No. 6, with which he won the Deutsch Prize. The amount of gas it contains is approximately the same. It resembles more the Lebaudy than the Santos Dumont machine, however, by having a very short hull, mounted close under the gas vessel, but differs from the latter in not having any fixed aeroplanes, or other rigid constructions, mounted between the motor and the gas vessel. The Spanish airship will be provided with two Levavasseur motors of extreme lightness, developing 24 h.p. each. The airship is intended for experimental purposes, and a new feature will be an adjustable balance weight for preventing "pitching."

The Italian Government Following Suit.

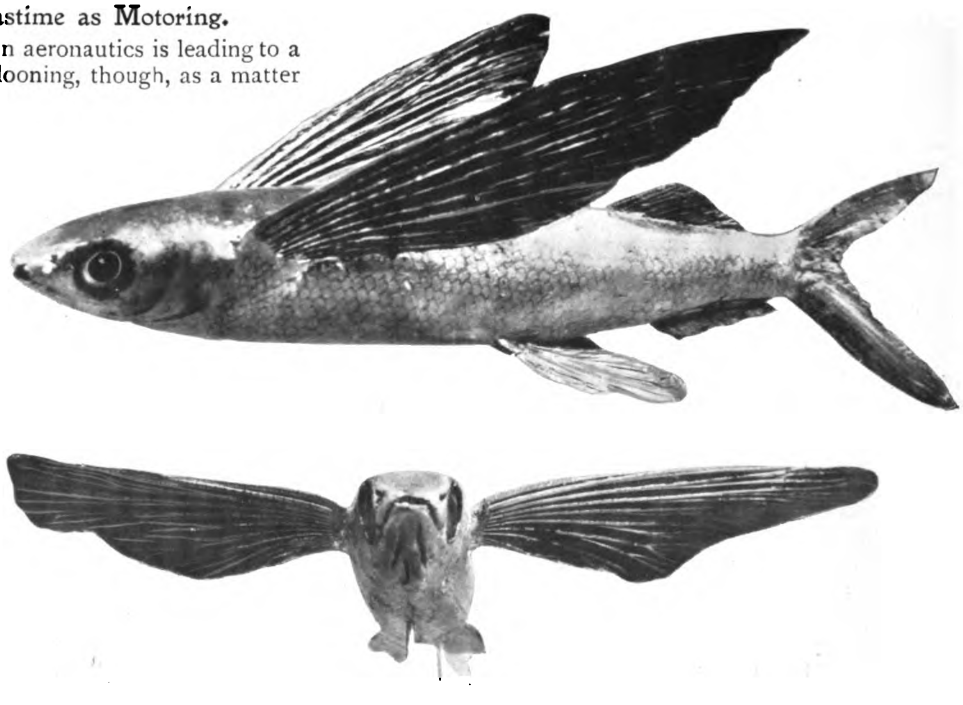
ANOTHER airship of the navigable balloon type, entitled the Italia, is being constructed under the auspices of Count Almerico de Schio, while a company is being formed at Parma to build an airship according to the designs of Capt. Frassinnetti.

Another French Aeroplane.

THOUGH activity has thus been concentrated mainly upon the navigable airship, the aeroplane is not being altogether neglected, and another experimenter has appeared in the field—M. Albert Bazin, of Marseilles—with a machine of the heavier-than-air type. The machine consists, we understand, of two wings fixed together (possibly this means two superposed aeroplanes), and is provided with a hull in which the aeronaut takes his place. Wings for controlling the machine and ensuring its stability are mounted behind, and the total span is 11 metres from point to point, and 1½ metres in the direction of movement. This suggests a machine resembling the Wright or Chanute aeroplane in general appearance, but the tail is apparently much larger, being some 5 metres in length. At any rate the apparatus is well thought of by Capt. Ferber, who is said to have purchased it from M. Bazin with a view to experimenting with it.

Ballooning as Cheap a Pastime as Motoring.

THE increasing interest in aeronautics is leading to a more general interest in ballooning, though, as a matter of fact, the two subjects have very little in common, and it is a curious fact that none of our veteran balloonists have effected anything noteworthy even in the navigable airship line of research, much less in regard to aeroplane. At the same time, ballooning may have its uses in familiarising would-be experimenters with the sensations of being up in the air. It is, at any rate, a delightful and health-giving pastime, and it is, accordingly, satisfactory to learn that with the price of balloons coming down very markedly, the cost of gas at first hand becoming less and less, ballooning, as a sport, is being brought within the reach of anyone who can afford the expenditure involved in even a moderate-sized motor car In fact, as has been pointed out, you can take a balloon trip across the Channel or so, at a cost that does not practically exceed the expenditure involved in a Saturday to Monday trip to Brighton, while if you are a member of the Aero Club, you can do it cheaper still.



Two other species of Flying Fish, forming a part of the collection at the British (Natural History) Museum. The side view represents a fine specimen (13½-in. long) of an Exocoetus Cahiensis, found in the Atlantic Ocean, while beneath is an excellent view from the front showing an Exocoetus Spilapterus (from the Indian Ocean) with "wings"—10¼-in. from tip to tip—outstretched.

Activity in Airships.

ACTIVITY seems to vary its direction in the aeronautical world as much as in others. Latterly we have had almost a superfluity of aeroplane experimenters, none of whom, however, except the Brothers Wright, have done anything really very epoch-making. And now the navigable balloon seems once again to have become the fashionable amusement, at any rate on the Continent. Possibly this is due to the exploits of the Lebaudy airship. The German Government is bent on making good the failure of the Zeppelin machine, and is concentrating its energies on the construction of a new airship of the navigable balloon type.

A German Navigable Balloon.

IT is to Major August von Parseval, a prominent aeronaut, who has distinguished himself in the design of various types of kites, that the German Government owes the designs for the new airship of the navigable balloon type with which, as we have explained, the shortcomings of Zeppelin II. are to be made good. The airship comprises the usual parts of a separate gas-vessel with a rudder mounted at its extreme end, and a hull carrying the propellers and motors. The shape of the gas-vessel is a good deal like that employed by Count Zeppelin, being cylindrical throughout most of its length and rounded off at its ends. It is 48 metres in length and measures 8½ metres in diameter. Its cubic capacity is 24,000 cubic metres, and it is provided with two ballonettes to keep the surface of the gas-vessel tight, the ballonettes being kept full of air by means of fans driven from the motor. Aeroplanes are employed to give steadiness to the movements of the airship, one on each side, underneath the gas-vessel, and a third one at the rear. The car is of aluminium and steel, and is capable of carrying two, or at most three, passengers in addition to the motor and accessories. The propeller is placed above the car. It is thus saved from coming into violent contact with the ground when alighting. The motor which supplies the propulsive power is a 90-h.p. Mercedes, weighing 40 kilogs. A peculiarity of the construction of the propeller is said to be that the blades are stiffened by centrifugal force when rotating. Major Parseval anticipates accomplishing a speed of some 50 kiloms. per hour. The first tests will be made with the new machine in the neighbourhood of Berlin in the approaching spring.

Towards the Pole.

The progress of the Wellman Polar airship appears to be satisfactory, and it is now understood that, in addition to the 50-h.p. motor, it will be provided with a 25-h.p. additional motor and a smaller screw. The explorer's intention is to employ the airship with a trailing guide-rope at a quite moderate elevation, starting preferably with the wind, and merely attaining sufficient speed through the air to render the airship thoroughly controllable. In case of an accident to the principal motor or propeller, he will be able to proceed at diminished speed with the subsidiary equipment, while, should it become at any moment imperative to proceed at higher speed, he can work the two together, in which case it is estimated that his speed will increase from the ordinary 25 kilometres to some 32 kilometres per hour. Mr. Wellman intends spending some weeks at his base on Spitzbergen, and thoroughly experimenting with the airship before making his actual start for the Pole.

The Death of M. Archdeacon.

All aeronauts, and a great many other people, too, will learn with the most profound regret of the sudden death of M. Edmond Archdeacon, the well-known Nationalist Member of the Chambre, and one of the most enthusiastic experimenters and writers on all problems connected with the conquest of the atmosphere. M. Archdeacon was well-to-do, and gave a prize for the first aeronaut to cross the Pyrenees in a balloon, which was won by Signor Durot, a month ago. In combination also with M. Deutsch, he has offered a prize for aeroplanes and steerable balloons, which has yet to be competed for. M. Archdeacon was a convinced disciple of the aeroplane method of tackling the problem of aerial navigation, and has been, for some time back, experimenting with various types of aeroplanes, till the news of the exploits of the Wright Brothers induced him to give up his practical work, owing to his conviction that the problem had now been satisfactorily solved.

* * * *

War Office Registration of Heavy Vehicles.

Some little time back we drew attention to the extent to which the elimination of the horse from public service vehicles is presenting a serious problem to the military authorities, and referred to proposals which had been put forward to the effect that the War Office would be well advised to replace the registration of horses for military service, which has been the system hitherto adopted, by the registration of heavy motor vehicles for use in war time. The idea, of course, is exactly similar to that adopted by the Navy in regard to the steamship lines, which receive annually a certain "subsidy" on the understanding that they are to place their vessels at the service of the Navy should war break out. The War Office has now addressed a letter to the Motor Van and Wagon Users' Association proposing a scheme of this kind, and this letter has been forwarded by them to a number of owners of commercial vehicles, asking them whether they would be prepared in general to support the War Office scheme, what their views are as regards a fair annual sum, in respect to each heavy motor car registered, and what proposals (if any) they have to make for the improvement of the scheme.

The broad outlines of the Government scheme are as follows:—

> The owner of registered heavy motor vehicles, in consideration of which registration a small sum should be paid annually by the War Office, to agree to allow the War Department to make use of the vehicles for a time or to purchase them on previously arranged conditions.
>
> The rights which the War Office would then enjoy, would be to hire the vehicle for peace manœuvres for a certain number of days in each year, and, in times of war, the vehicles would be purchased outright by the Government if required for foreign service, while if used for home defence, they could be bought back at a valuation by the owner after the War Department had finished with them.

The War Office is to be congratulated on adopting this initiative, and as there are no doubt a large number of heavy vehicle owners who would be prepared to avail themselves of the proposals, a satisfactory scheme is likely to be agreed upon as the result of mutual discussion at an early date.

The Renault "Direct-Drive" Patent in France.

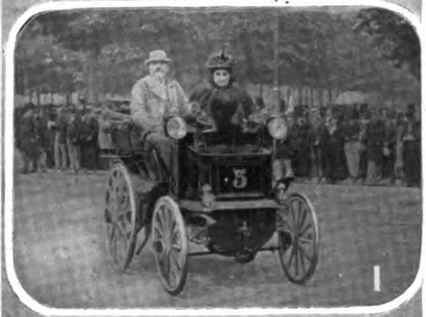
We have received from the Secretary of the British Empire Motor Trades Alliance a translation of the provisional agreement that has been entered into between the Renault firm and twelve other French manufacturers, and of which some particulars have already been given in The Automotor Journal. From it, we are now able to state definitely that no chain-driven cars, nor any in which there is gearing between the differential and the road wheels—even though a direct-drive is obtained in the gear-box—are deemed to infringe the Renault patent. Another significant provision is that the Renault firm undertake to fix their terms of royalty on foreign vehicles, imported into France, at a figure that shall be at least twice that obtained from French licensees. The Paris correspondent of the B.E.M.T.A. further indicates the feeling in France on this matter; they hope to annul the French patent under Article 18, in view of the Whitney patent, but think that that patent will not invalidate the English Renault patent if Renault takes the precaution of amending it before taking action.

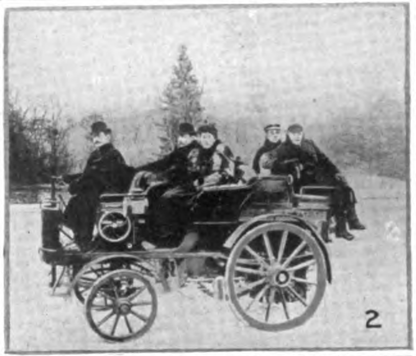
Edinburgh Looking Ahead.

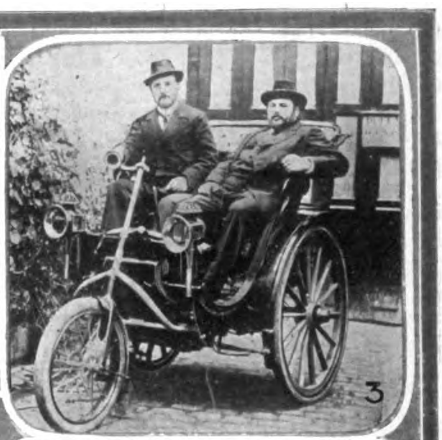
On the motion of two Town Councillors the Edinburgh Tramways Committee have had remitted to them, to consider and report on, the utility of motor 'buses for public service, safety, and convenience; and whether, in view of their rapid improvement, past and prospective, further laying down of tramways may be a waste of public money.

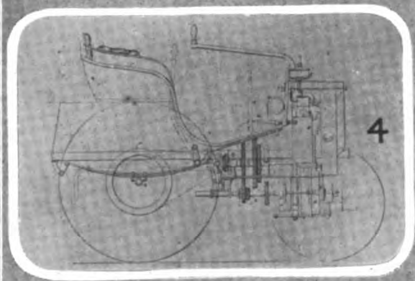
THE HORSELESS CARRIAGE—1885-1905.

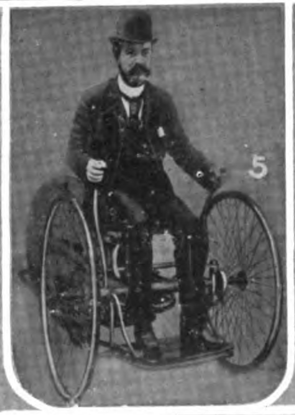
An Interesting Historical Review.

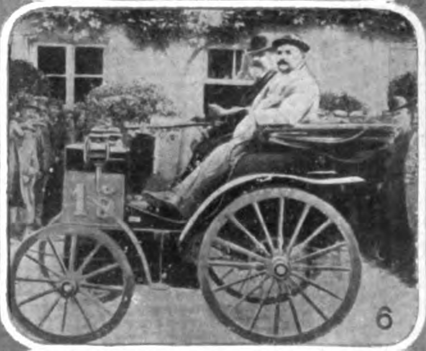


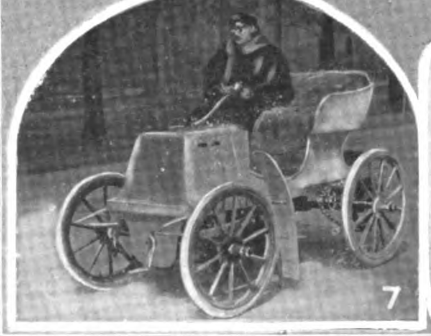


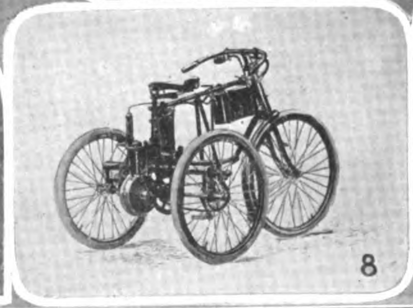


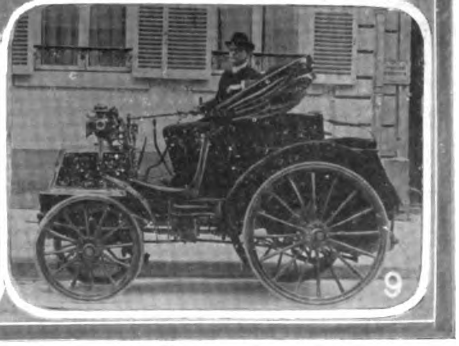












ON Wednesday of last week (February 14th) before a meeting of the Society of Arts, Mr. Claude Johnson read a very entertaining paper, entitled as above, the paper being accompanied by a very large number of lantern slides, representing well-known people as well as celebrated cars. Covering so wide a field, and extending over the twenty years that have seen the entire development of the petrol car, the lecturer was compelled to confine himself to a series of brief references to the more important events of that period, the result being an historical review of the rapid rise of an extremely remarkable industry. Apart from the permanent value of the paper to those who are not already acquainted with the progress of the movement and have not followed its development in greater detail than is possible in so comparatively short a lecture, motorists were afforded an excellent opportunity for once more renewing their acquaintance with many old friends. It is only too easy to forget even the leading characteristics of the earlier types of vehicle, but there is always much to be learnt by looking at them again in the light of present day knowledge. For this reason, we reproduce a few of the more interesting illustrations of early vehicles which were thrown upon the screen during the evening, and below we give the necessary particulars by which they can be identified. Apropos of the value of these early records, concerning the design and construction of the pioneer vehicles, Mr. Johnson put forward the suggestion that the Society of Arts might use its influence in the getting together of a collection of as many of these old vehicles as could be still secured. He stated that he had found the very greatest difficulty in obtaining any detailed information about them—even from the manufacturers themselves—and he referred to the unsuccessful attempts that had hitherto been made by himself and by others to induce either the Government or the Committee of the Automobile Club to take sufficient interest in the matter, or to make any move in this direction. A suggestion of the kind was put before the Science and Art Department at South Kensington some years ago, and the club had frequently been urged to form a collection of scale models and photographs.

(1) Mons. Levassor on his 1894 Panhard.
(2) An early Serpollet 4-wheeler (1895).
(3) Mons. Serpollet on his 3-wheeler (1894).
(4) Sectional drawing of 1894 Panhard.
(5) Mr. Edward Butler on his Tricycle (1888).
(6) Mons. and Mme. Levassor on the Paris-Bordeaux Winner (1895).
(7) Charron's 6-h.p. Paris-Dieppe Panhard (1897).
(8) An 1894 De Dion Tricycle with $\frac{3}{4}$-h.p. motor.
(9) The first 4-cylinder car, the 1896 Panhard winner.

EXPERIMENTS ON THE USE OF THE ENGINE AS A BRAKE.*

By W. Watson, D.Sc., F.R.S.

THERE having been a considerable amount of discussion in the automobile papers on the use of the engine as a brake, I think that some quantitative experiments on the point may be of interest. Further, I have endeavoured to show by experiment exactly how the power absorbed is spent. Not having any means of measuring the loss which takes place in the transmission gear between the engine clutch and the road wheels, I have had to content myself with measuring the power absorbed by the engine alone, but I see that some experiments by Pétard show the efficiency of transmission to vary from 76 per cent. on 2nd speed to 89 per cent. on top speed with direct drive.

The engine used for the experiments is a comparatively slow-running 2-cylinder 4-cycle engine, with mechanically-operated inlet valves, and is governed on the throttle, the lift of the valves being fixed. The bore is 88·9 mm. (3·5 in.), and the stroke 101·6 mm. (4 in.), the cranks being at 180 degs. The engine was coupled up by means of a belt to an electric motor, and the power taken by the motor was deduced from the readings of a standard ammeter and voltmeter placed in the circuit.

In order to be able to apportion the power required to drive the engine between that spent in overcoming friction and that spent in doing work on the air drawn into the cylinders, it was necessary to take indicator diagrams. These were obtained by means of a Hospitalier-Carpentier manograph. The general arrangement of the engine and manograph is shown in Fig 1. The manograph, A, is connected by a short branched tube with the cocks, C, so that either cylinder can at will be connected to the instrument. The reciprocating motion corresponding to the piston travel is communicated by means of a roller chain and two sprockets, a clutch, D, being placed between the upper sprocket and the manograph. This clutch can engage in two positions 180 degs. apart, and the reason for using it is illustrated in Fig. 2. This figure represents two diagrams taken immediately one after the other; but the connection between the manograph and the engine through the clutch has been altered, so that while in one case the explosion takes place when the spot of light is at one extremity of its path, in the other it takes place when the spot is at the other extremity, the photographic plate having been slightly displaced between the two, so as to separate the diagrams to a certain extent. It will be noticed how the diagram is distorted at one end. Thus, in the left-hand side the pressure line, in place of being vertical, is very much inclined, and, further, the scale is contracted at this end. If, however, all diagrams are taken with the peak of the diagram to the right, the distortion has not much effect on the area enclosed, since the pressure at the end of the stroke is comparatively small.

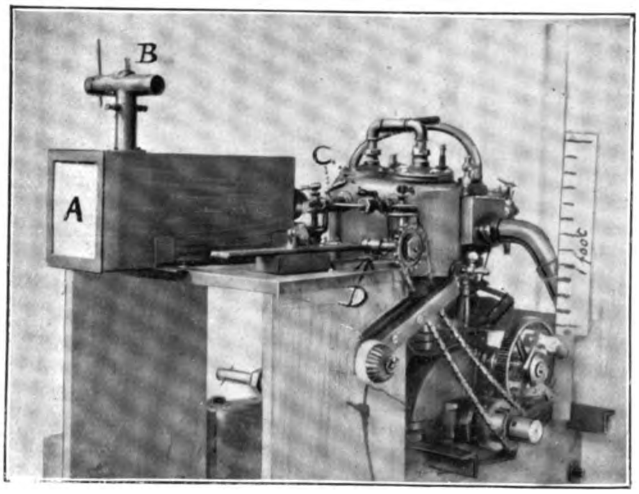


Fig. 1.

A typical diagram for the engine when developing its full power is shown in Fig. 3. This diagram was taken when the speed was 700 revolutions a minute, and the mean effective pressure is 6·14 kilogs. per square centimetre (87 lb. per square inch), the i.h.p. being 5·94. It will be noticed that the exhaust and inlet strokes take place almost exactly at atmospheric pressure, for the valves being of ample size, very little throttling takes place. On this and the other diagrams the inlet stroke is indicated by a single arrow head, the compression stroke by two, the working stroke by three, and the exhaust by four.

All the braking experiments have been made with the engine running at 590 revolutions per minute, and with the temperature of the cylinders about 50 deg. Cent. The speed having been adjusted by means of a variable resistance in the motor circuit, the watts absorbed by the motor were obtained by reading the ammeter and voltmeter. The watts required to run the motor light having been measured, and likewise the armature resistance, it was possible to deduce the power taken to drive the engine.

The first experiment consisted in measuring the power required to run the engine when no variations in pressure took place in the cylinders, the whole of the power being absorbed in doing work against the friction of the moving parts of the engine. In order that the pressure should not appreciably vary in the cylinders, the plugs over the valves were removed, when no measurable change of pressure was shown on the manograph. The power required to drive the engine was 0·75 h.p. (see table below).

TABLE.

H.-P. at 590 revolutions per minute.

	To drive engine.	After deducting friction.	Indicated.
1. No compression	0·75	—	—
2. Throttle open	1·03	0·28	0·27
3. Throttle closed	1·22	0·47	0·46
4. Throttle open, compression cocks half open	1·39	0·64	0·70
5. Throttle closed, compression cocks half open	1·49	0·74	0·79
6. Throttle open, compression cocks full open	1·63	0·88	0·91
7. Throttle closed, compression cocks full open	1·69	0·94	0·94
8. Throttle open, exhaust valve always shut	[1·60]	—	0·88
9. Throttle open, exhaust valve open during third stroke	[2·40]	—	[1·65]

Next, the valve plugs having been replaced, the power required to drive the engine in its ordinary running condition, with the throttle full open, was found to be 1·03 h.p. Hence, deducting the 0·75 h.p. required to overcome friction, there remains 0·28 h.p. as the power expended in sucking air into the cylinders, compressing and expanding this air very nearly adiabatically, and then forcing it out through the exhaust. The corresponding indicator diagram is shown in Fig. 4. It will be noticed that in the expansion stroke (No. 3) the pressure falls a little below the corresponding pressure in the compressson stroke (No. 2). This is due to the loss of heat to the cylinder walls and to slight leakages past the valves, piston rings, &c. The area included is, however, very small, a larger area being included between the induction and exhaust lines. It should be noted that the pressure scale of Figs. 4 to 10 is considerably more open than in Figs. 2, 3 and 11, a thinner steel disc being used in the manograph. The total power corresponding to the areas enclosed in Fig. 4 is 0·27 h.p. This value agrees very well with the additional power expended in driving the engine—namely, 0·28 h.p.—indicating that this additional work is simply due to the work done on the air.

In Fig. 5 is shown the result of closing the throttle. Here the pressure on the induction stroke sinks considerably below atmospheric pressure, and the branches 1 and 4 of the curve enclose a considerable area. The indicated horse-power is 0·46, while the power required to drive the engine is 1·22 h.p. After deducting the work done against friction we get 0·47 as the additional power required on account of the work done on the air in the cylinder, which, again, agrees very well with the indicated horse-power.

In Fig. 6 is shown the indicator diagram obtained when the throttle is open and the compression-cocks are half opened. The cocks being half open is equivalent to the interior of the cylinder being in free communication with the external air by means of a hole $\frac{3}{16}$ of an inch in diameter. The indicated horse-power is now 0·70, while the power required to drive the engine is 1·39 h.p., the additional power required on account of the work done on the air being 0·64 h.p. On closing the throttle, keeping the compression-

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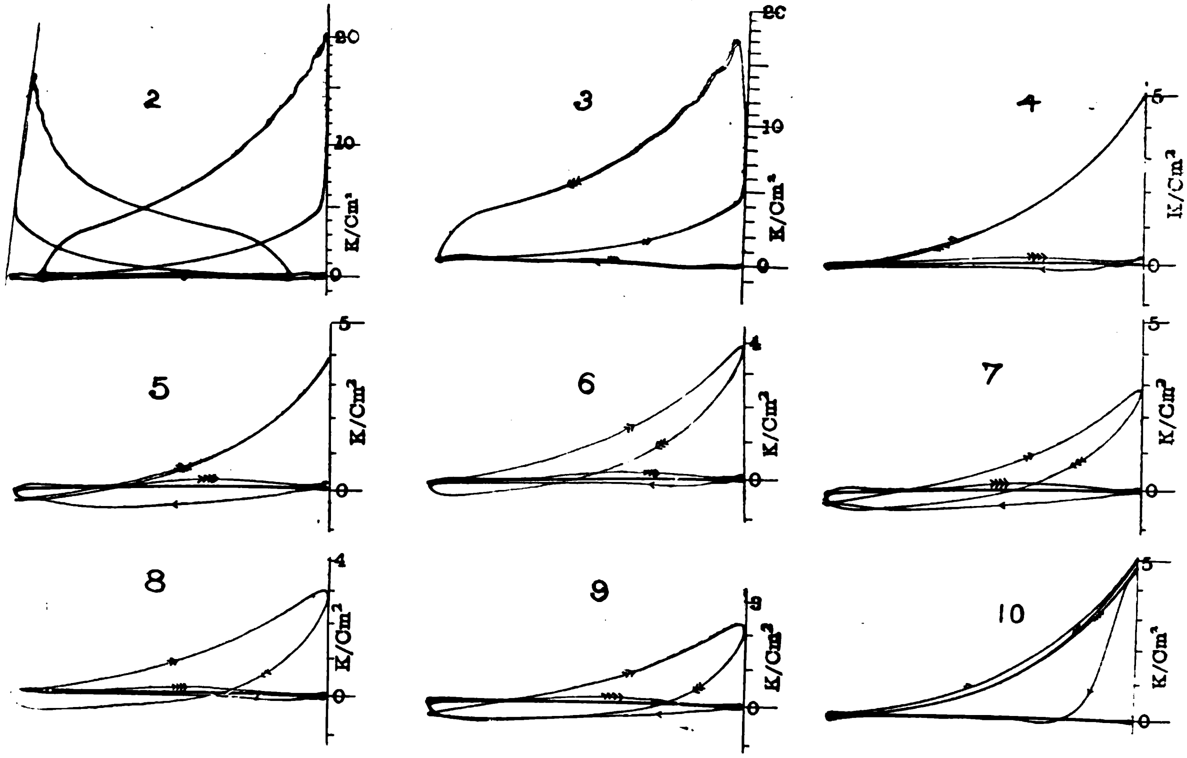
*Abstract of a paper read before the Automobile Club, on Thursday, February 15th, 1906.



Figs. 2 to 10.—Dr. Watson's Manograph Diagrams. (To convert kilogs. per sq. cm. into lbs. per sq. in., multiply by $\frac{128}{9}$.)

cocks half open, the diagram obtained is shown in Fig. 7, and the corresponding powers are given in line 5 of the table.

On opening the compression-cocks to their full extent, which corresponds to a hole ¼ in. in diameter, we obtain Fig. 8 with the throttle open, and Fig. 9 with the throttle closed, the corresponding power being shown in lines 6 and 7 of the table. Here it will be noticed that the indicated horse-power has risen to ·94, the total power required to drive the engine being 1·69 h.p. Experiments were not made with larger orifices, since an examination of the diagrams and numbers showed that no appreciable improvement was likely to be produced.

Before proceeding to discuss the results, attention may be drawn to Fig. 10. This is the indicator diagram obtained when the exhaust-valve is prevented from opening, so that there is now compression on stroke 4, the pressure at the commencement of stroke 1 falling rapidly, owing to the opening of the inlet-valve. There is now a considerable area enclosed between lines 1 and 4, the indicated horse-power being 0·85, which corresponds to 1·60 h.p. required to drive the engine. This power was not directly measured, since the previous measurements had shown that by adding ·75 h.p. to the indicated horse-power we obtain the total power required to drive the engine.

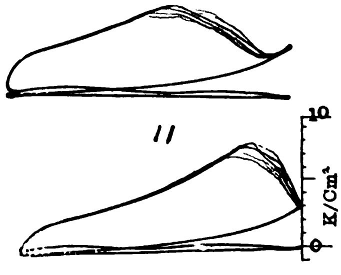


Fig. 11.—"No-load" Diagrams.

If it had been possible to alter the phase of the cam which opens the exhaust-valve, so that in place of opening in stroke 4 it opened in stroke 3, then the indicator diagram obtained would consist of two loops similar to the loop included between strokes Nos. 1 and 4 of Fig. 10. The indicated horse-power would then be 1·65, and the total power required to drive the engine 2·40 h.p. This represents the maximum braking effect which it is possible to obtain with the engine, and we have now to consider what relation these various braking horse-powers bear to the horse-power the engine develops when working. As has already been mentioned, the engine, when working at 700 revs. per min., develops 5·94 i.h.p. This corresponds to 5 i.h.p. at 590 revs. What we require, however, is the brake horse-power. This may be obtained by measuring the indicated horse-power at no load. Since, however, it was found that with no load the diagram was very irregular if both cylinders were allowed to fire, one cylinder was prevented from firing by holding down the corresponding trembler. The diagrams thus obtained are shown in Fig. 11. The speed being 690, the indicated horse-power is 1·52. This corresponds to an indicated horse-power of 1·30 at 590 revs. Since the throttle was almost closed, the conditions under which the engine was running resemble those of line 3 of the table, where the power to run the engine was found to be 1·22 h.p. The agreement is thus seen to be good, and hence we may take the brake horse-power as being 3·7 at 590 revs.

Hence, collecting the results of the experiments, we have :—

	H.P.	Ratio of braking to power.
Power delivered at clutch by the engine when working	3·7 ...	—
Braking effect when throttle is closed ...	1·22 ...	33%
Braking effect when throttle closed and compression cocks open	1·49 ...	40%
Braking effect when exhaust-valve is prevented from opening	1·69 ...	46%
Braking effect when exhaust-valve is opened on No. 3 stroke	2·40 ...	65%

Thus the maximum braking effect which can be obtained at the clutch is 65 per cent. of the power the engine is capable of giving at the clutch. If we were to take into account the losses in the transmission gear between the clutch and the road wheels the percentage of braking effect would be considerably increased, since this loss in transmission would decrease the power delivered by the engine and increase the power absorbed when the engine acts as a brake. Thus, if the loss between the clutch and the road wheels amounted to 15 per cent., the maximum braking effect rises to 88 per cent. of the power the engine is capable of exerting, it being supposed, of course, that the same gear is employed in the two cases.

It will be seen from the above that the engine is capable of being used as a powerful brake, and one which possesses this important advantage over the ordinary brakes in that the water-circulating system will remove the heat generated, and thus prevent the occurrence of burnt brake leathers and such-like.

SOME UNSOLVED PROBLEMS IN MOTOR ENGINEERING.

UNDER the above heading, a very interesting paper was read by Colonel R. E. B. Crompton, C.B., R.E., &c., before the Automobile and Cycle Engineers' Institute, at the Royal United Service Institution last week (February 14th), and in this paper he brought forward a number of vital questions affecting the future prospects of the automobile industry. Many of the points raised were naturally of a somewhat debatable character, and consequently the discussion, which is to be concluded at the next meeting (it is hoped next Wednesday), ought to bring to the front some further useful views from those taking part in it. Col. Crompton clearly showed that he is by no means satisfied with the present practice in motor car construction, and it was also evident, from what he said, that he does not look upon the petrol engine of to-day as being anything like final. Even its relative merits in comparison with steam are, he thinks, grossly exaggerated in the eyes of the motoring public.

In his introductory remarks he pleaded that—although he spoke from the standpoint of a mechanical engineer who had closely studied the subject for over forty years—it was impossible for him to possess as great a knowledge in many matters of detail as those engineers who have given their entire attention to the manufacture of cars during the past few years. He then briefly reiterated the distinctive features of the modern petrol vehicle, remarking that it apparently had settled itself down into a well-defined form with a long low-hung chassis having a wheel base of from 9 to 12 feet, and with comparatively small wheels, shod with 30 to 34-inch rubber tyres. After mentioning the other orthodox characteristics of such vehicles, he expressed his regret that any cars deviating from such design should, irrespective of their merits, be regarded as "freaks." He fully admitted that for touring work, and even for town use, the car of to-day gives most excellent results, but what he did lay special emphasis upon was the fact that the same constructional features, when applied to commercial vehicles and to vans, were far from satisfactory and needed radical modification.

Passing on to give actual instances bearing upon these general observations, he took in sequence matters affecting the engines, the gearing, the wheels with their tyres and springs, as also the proper height of the vehicle above the road surface. In dealing with the engine question, he made an exceptionally strong point—one which is bound to lead to considerable discussion—of the superiority of up-to-date steam systems over the petrol engine, even at the present day.

Petrol Engines.

There were two main respects in which Col. Crompton considered modern petrol engines were defective, one of these being of an essentially radical character, and the other of a far more detailed nature. Mentioning the latter first, since it can be dismissed in a comparatively few words, we refer to his strong advocacy of further development in paraffin carburettors. He pointed out that although it is quite true many existing engines will run on paraffin when once heated, yet there is no really satisfactory vaporiser or equivalent device that renders starting easy with heavier fuels, or subsequent running absolutely successful. The really radical departure which he advocated, and on which he spoke most strongly, was the total abolition of the present "Otto" cycle, and the adoption of some such system as that tried some few years ago by Brayton for simplifying the engine itself and rendering it much more like a steam engine. He pointed out that many difficulties would undoubtedly have to be overcome before this object could be attained, but that the "Brayton" method of obtaining a continuous series of explosions in an independent chamber, and of merely feeding an engine with this elastic fluid under pressure would, from many points of view, be infinitely superior. Col. Crompton, did not, however, enter into any details of a constructional character, or point out the exact nature of the present troubles which would have to be eliminated.

Also, by way of adverse criticism of modern petrol engines, Col. Crompton expressed the views that magnetos, or indeed any electric ignition systems, were almost too far outside the province of the ordinary driver of a motor car to render them altogether desirable, and that, although a multiplicity of cylinders was necessary in order to ensure smooth running, yet the risk of stoppages occurring on the road was necessarily greater, owing to so great an increase in the number of parts, even if the increased cost of pro-

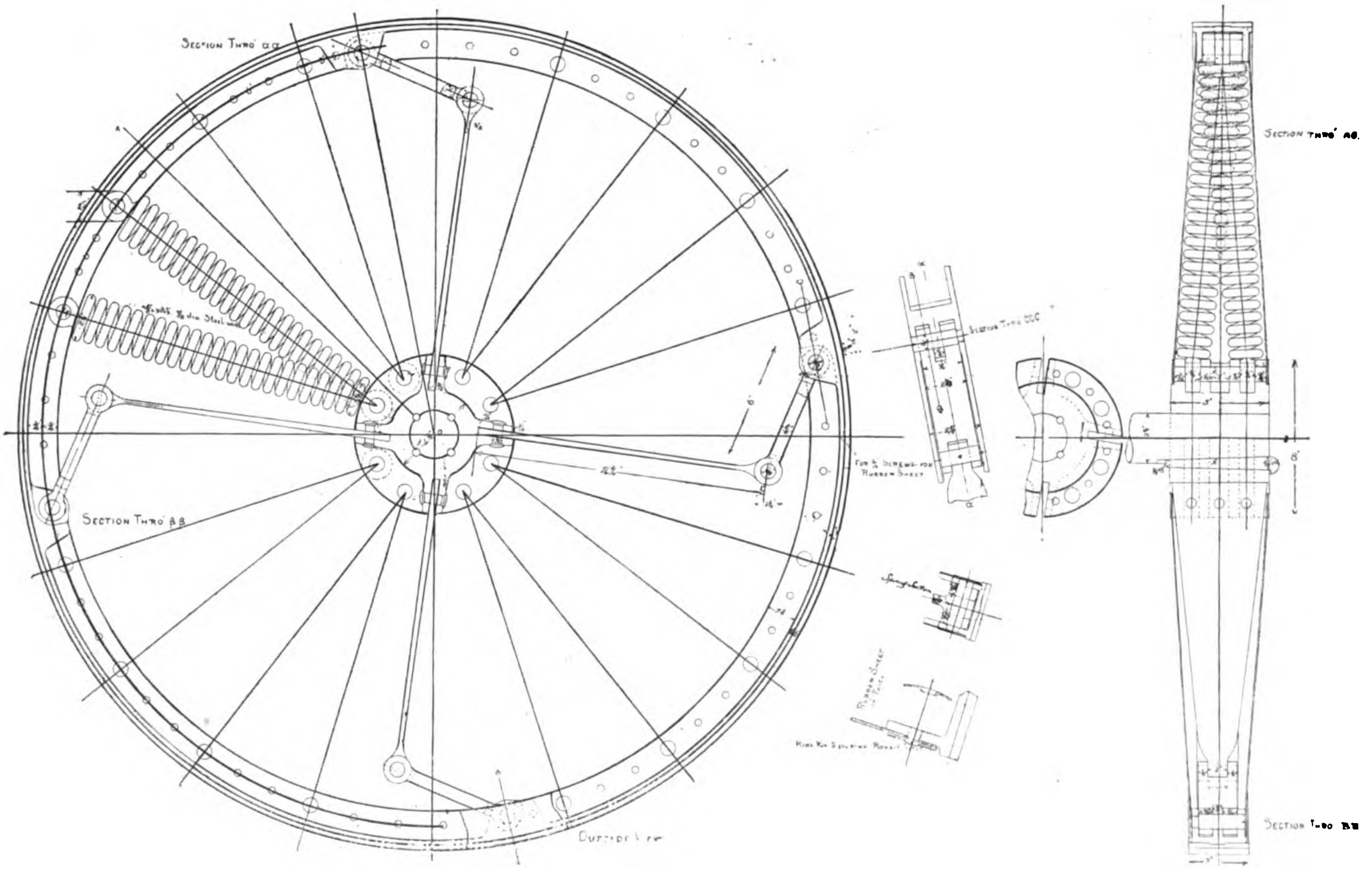


Fig. 1.—Prof. R. H. Smith's "Spring-Wheel," the special feature of which is that the radial springs only serve the purpose of absorbing the shocks, and that separate, linked spokes are fitted for transmitting the "drive" from the hub to the rim.

duction were to be largely compensated by the adoption of improved processes of manufacture.

Steam Engines.

Admitting that at present the petrol engine is in far more general favour for smaller vehicles, and that remarkable improvements have been made in its design and manufacture, Colonel Crompton considered that the introduction of flash and semi-flash boilers had brought about an equally evident improvement in steam systems for the propulsion of the same class of vehicle. He even went so far as to state that the most up-to-date steam cars can quite easily hold their own as regards running cost, as well as in all other respects. In support of this view he gave the following table :—

Comparative Cost Per Annum—on a 5,000 Miles' Basis—of Steam and Petrol Touring Cars.

	Steam Driven.	Petrol Driven.
Steam car, costing £600.	£ *s.* *d.*	£ *s.* *d.*
Depreciation at 15 °/o per annum ...	90 0 0	—
Petrol-driven car, costing £900.		
Depreciation at 15 °/o per annum ...	—	134 0 0
Fuel, on 5,000 miles' basis.		
Steam car, at 14 miles per gallon of paraffin or benzolene at 7½*d.* ...	11 5 0	—
Petrol car, at 20 miles per gallon of petrol at 10*d.*	—	10 10 0
Tyre repairs.		
Steam car, one complete set two-thirds worn out	37 0 0	—
Petrol car, one complete set fully worn out	—	41 0 0
Stores	7 15 0	21 0 0
Other repairs	32 0 0	45 0 0
	£178 0 0	£251 10 0

The figures taken in it are based on the assumption that the initial cost of a large touring car, seating five or six people, and able in addition to carry a fair amount of luggage, is, on the average to-day, 50 per cent. more if it is a petrol car than if it is a steam vehicle. The petrol car is taken at £900 and the steam car at £600, and Col. Crompton expressed the view that some such difference in price as this will always continue to exist, owing to the greater number of parts that are necessary for the petrol car. As will be seen from the table, the chief item which tells so strongly in favour of the steam car is that of depreciation. Colonel Crompton's contention therefore is that the essentially greater prime cost of the petrol vehicle much more than outweighs any gain it may otherwise have in fuel consumption, and that even its greater tyre bill alone does so also. He pointed out that the petrol car must have at least four, if not six cylinders, and that the steam car need only have two.

Speaking further on the relative merits and demerits of steam, he dwelt on the fact that flash generators, as made to-day, need practically no attention, but that, on the other hand, there was a considerable amount of room for improvement in vaporisers and in burners for enabling them to consume heavier and cheaper fuels than petrol or benzoline.

Gearing.

Colonel Crompton's remarks on the question of gearing were more especially applied to vehicles propelled by internal combustion engines than to steam cars, and he commenced by showing that even if the so-called direct-drive were provided for, there were yet necessarily three shafts instead of two, since an extra shaft was required for changing speed and for reversing (with a chain drive it is four shafts that are needed). He was strongly of the opinion that this multiplicity of shafts and of gear-wheels cannot long survive, and this in itself was one of his strongest reasons for holding that the "Otto" cycle would have to give way to a more elastic type of engine.

Even, while still using petrol engines as they are, Col. Crompton holds it to be most important that the transmission gear should be simplified, and that, at any rate, no more than three shafts—the axle, the propeller-shaft, and a combined clutch and reversing mechanism—should be employed. Concerning the gearing itself, he very strongly condemned bevel gearing, since it needs most careful adjustment and perfect workmanship. Instead of bevel wheels, he expressed himself to be an ardent advocate of worm gearing, pointing out that an extremely large contact surface was obtained, and that it was always easy to maintain a true contact surface, even after wear had taken place. In his opinion there was an overwhelming advantage to be gained with worm gear from the point of view that the contact surfaces could be made large enough to prevent the film of oil from being squeezed out from between them as it is with bevel gear.

Col. Crompton very strongly condemned the ordinary type of change-speed-gear now employed, and referred to the very short life of the "second" and "third" speed wheels in particular on the motor 'buses that are now in use. He stated that many of these wheels only lasted for a few months, and he very forcibly condemned the noise and rattle which is already so apparent in the streets from this cause. He was quite convinced, in fact, that all intermediate speeds should be entirely abolished, and he was satisfied—after having gone carefully into the question—that motor omnibuses could be successfully run with no change-speed-gear at all. Naturally, of course, the size of the cylinders would have to be increased in order to enable the engine to start the car on the top gear.

Wheels, Tyres, Springs and Axles.

The comparatively small size of the wheels and tyres of to-day has, the lecturer said, entirely resulted from the introduction of rubber tyres, for not only is the cost of this resilient material considerable, and it is the greater speeds which have been rendered possible by them that have made it advisable to keep the centre of gravity of the vehicle lower. From the point of view of the commercial vehicle, in particular, the cost of upkeep of tyres and wheels is, as he said, a very serious item. He therefore thought that considerable attention should be devoted to the question, and that consequently spring wheels should, if possible, be developed. Most of those which had already been tried are, he held, much too noisy if they have metallic tyres to crush the surface of the roadway, and it might well be found necessary to restrict their speed of travel in consequence. An alternative, however, is to cover the rims with some noiseless resilient material. From his study of spring wheels, it appeared to him that inventors had proceeded along two distinct lines, one of which was, he thought, entirely wrong. He referred to that class of wheel in which an elastic material, such as rubber, is used to give the necessary cushion action, and is merely fitted nearer to the centre of the wheel instead of upon its periphery. He condemned this principle, because its main object was to reduce the amount of rubber, and in consequence to greatly increase the wearing action upon it. Even when using metallic springs instead of rubber, he thought it equally necessary that no attempt should be made to reduce their weight unduly, for it is essential that they should have such a cross-section as would satisfactorily absorb the work put into them.

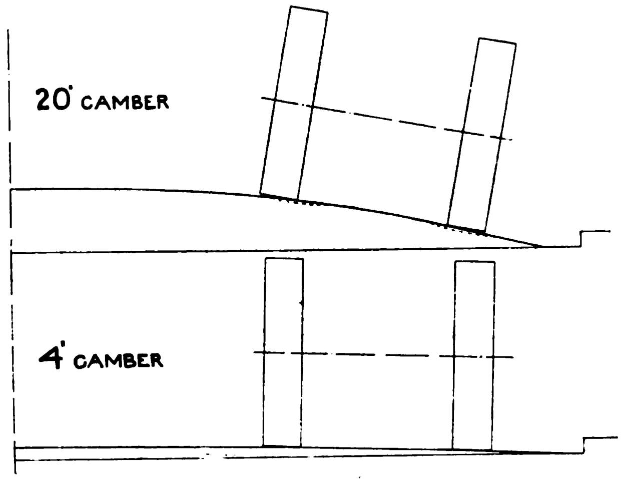


Fig. 2.—Two diagrams indicating the harmless effect of a 4-inch camber on a road 30 feet wide, and the detrimental action of a 20-inch camber both on the road itself and on the wheels and tyres of vehicles.

Several examples of spring wheels were brought before the notice of the meeting, but most of these are already well known in all their bearings by readers of THE AUTOMOTOR JOURNAL. One interesting instance of a wheel of this character was that designed by Professor R. H. Smith, of which we now reproduce a drawing (Fig. 1). In this wheel, the principle has been adopted that it is impossible to get sufficient elasticity from straight radial spokes, that each spoke can, however, be lengthened and thickened in the form of a long spiral, but that such spiral springs must not be used for the double purpose of transmitting the drive and of absorbing shocks. As will be seen, a second set of links is provided for transmitting the power from the hub to the felloe.

One great difficulty experienced by those engaged in the design of spring wheels was very carefully pointed out by Col. Crompton, this being the exaggerated camber in the cross curvature of many of our roadways. He mentioned that a well-made road, 30 ft. wide, ought not to have a total rise at the centre of more than four inches, and that with such roads there was no difficulty in getting a broad tyre to bear evenly all over its surface. He had, however, found many of our London macadam roads of this width with a camber of up to 20 ins., the bulk of the slope being close to the gutter. To show the trying conditions imposed by such road surfaces—as also the detrimental effects on the roadway itself—Col. Crompton brought before the notice of the meeting the diagrams reproduced in Fig. 2—these being, we think, self-explanatory. Designers of road wheels have at present this great difficulty to contend with, and Col. Crompton expressed the view that the excessive and irregular camber referred to is undoubtedly one of the chief causes of the deterioration and heavy wear of pneumatic tyres also. He thought it spoke extremely well for the inventive talent and constructive merits of the pneumatics of to-day that they could stand the severe strains imposed upon them from this cause as well as they do in practice. He urged combined action on the part of road authorities and car manufacturers, so that everything that it was possible to do should be done to minimise wear and tear of tyres and of roads alike. Spring wheels, in particular, were apt to suffer seriously, particularly those which have sliding devices near the rim for allowing a relative motion between the axle and the tyre. On the general question of the suspension of pleasure vehicles, Col. Crompton thought that the only error that had been made of late had resulted from attempting to reduce the weight of the springs unduly, for otherwise the springing of such vehicles was luxurious. In particular he commended the recently introduced three-point suspension with a transverse spring at the back.

Dustlessness.

In concluding his paper, Col. Crompton referred at some length to the important experiments which have been conducted over a long period by the Automobile Club, with the object of ascertaining the best means of reducing the dust nuisance. He stated that it had been shown to be most important to keep the under surface of the vehicle well above the road, and to so shape that surface that air currents at the back were avoided. The under surface of a car should take the form of the lower half of a fish, with a comparatively blunt nose but a fine stern. Another matter of importance was the provision of adjustable flaps on the front mudguards, so that these could be raised higher from the ground in dusty weather, and only let down in muddy weather. Col. Crompton also thought that better results would be obtained by using wheels of larger diameter, and by raising the car higher from the ground; and he pointed out in this connection that the tyres themselves would benefit considerably by so doing. In his opinion, tyres of larger diameter, with a less cross section, used in conjunction with wheels of improved design—possibly spring wheels—would ultimately be found best of all.

* * * *

Evils and Dangers of Motor 'Bus Racing.

THE evils and dangers of motor 'bus racing, to which we again draw attention editorially this week, have been emphasised by two instances, the reports of which in the daily Press effectively prove that we have not been denouncing a merely imaginary evil. They fortunately prove at the same time that the police are disposed to do their duty in the matter. We refer to the two instances in which the drivers of motor omnibuses were summoned before Mr. Plowden for exceeding the legal speed. The pace at which the omnibuses travelled was, according to the defending solicitor, limited by the governor, which prevented the 'bus exceeding the legal limit of 12 miles an hour, in the usual way, by cutting off the supply of explosive mixture when that speed was reached. Mr. Plowden observed that if this were really the case it would be a very important matter for the police, as they need never, in that case, summon omnibus drivers for exceeding the speed limit. At the same time he would like to see the apparatus in question thoroughly tested, and he adjourned the summonses in order that this might be done, and the question decided once for all, whether a motor 'bus could or could not proceed above the legal limit. In the other instance, a telephone worker, surrounded by the usual flimsy shelter, had been run into and seriously injured by a motor 'bus, the result ultimately being a coroner's inquest, in which one witness stated that, in his opinion, the motor 'buses had been racing along the Marylebone Road. This is exactly the sort of thing that we have complained of as a serious public danger. It is, in fact, as we have repeatedly declared, a much more serious danger than was possible when similar proceedings took place with the old horse-drawn 'buses. It is dangerous to the public, dangerous to the drivers, in fact, dangerous to everybody, and, after all, it only results from an unfair attempt to interfere with fair and open competition.

Still later, an even worse example of the results of motor 'bus racing has occurred near Baker Street Station. There was an actual collision between a "Vanguard" and a "General," the sort of thing that occurred of course often enough during the late Russo-Japanese War, but one which one must admit is undesirable in the heart of a city at peace with all the world. Fortunately, little damage was done, only one lady being slightly injured. But no one can really say what damage the same spirit, if allowed to run riot, may not produce at an early date. The principle involved does not in any case recommend itself to a sense of fairness. Why should the pioneers of the new method of locomotion—a new method of catering for the public—be "run off the roads" by an older organisation which, if left to itself, would, as far as can be judged, have introduced the motor 'bus about the time of the Millennium, if at all?

We repeat that we are glad the police have taken action in the matter. But after all, the little comedy which took place before Mr. Plowden has really nothing to do with the main question. Where 'bus competition results in racing, it is the reckless spirit engendered which is far more dangerous than the actual pace attained. A motor 'bus can be dangerous enough at 12 miles an hour, unless it is piloted by a cool-headed driver, whose only consideration is the safety of his vehicle and passengers. If he once gives way to the racing instinct and attempts to get to an important point before his rival, then danger in its most serious form is introduced into the situation. We would suggest, therefore, that instead of prosecuting the offenders for exceeding the speed limit, the police should proceed under Section I. of the Act, "to the danger of the public."

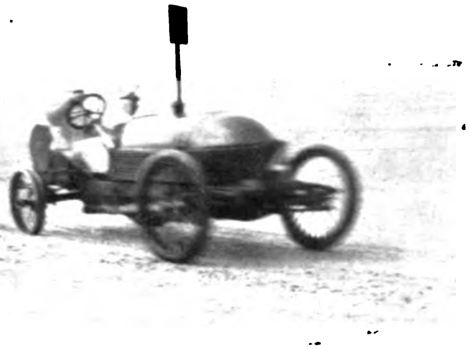
Renewal of Licences.

THERE has been an amusing passage of arms (by correspondence) between Earl Russell and the West Sussex County Council. On making application for renewal of his licence, the Clerk to this body asked for the previous licence to be forwarded to him. Lord Russell pointed out in reply that this was an illegal demand, and that the Clerk had no power to ask for it. This, ultimately, was admitted by the Clerk. Lord Russell pointed out that the Council official by withholding his licence had exposed him to the risk of prosecution for five days. The whole thing is a commentary on the preposterously muddled state in which questions of this kind have been left by the Act.

RACES, RECORDS, AND TRIALS.

Ormond - Daytona Races '06.

The Napier making the last turn in the Record 100 Ormond. 24/1/06. going 80 M.P.h. upon 3 tyres.



Ryan

65 MILES RACING ON THREE TYRES.—It has been regarded in many quarters as almost impossible that a racing car, like the 6-cylinder Napier, could be driven for 65 miles on the sand with one tyre missing, and that the car should not only under those circumstances, win the race, but put up a new time record for the 100 miles. That Earp *did* accomplish this feat, on Ormond-Daytona Beach, however, is quite certain, and we are able this week to supplement the photograph of Earp and his car without the tyre, which appeared in the last issue of the "Automotor Journal," by the one above taken of the Napier at full speed rounding one of the many turns. In this view, it will be clearly seen that the off-side rear tyre is missing.

A.C.G.B.I. Tyre, Speedometer, and Lamp Trials.

IN spite of the very meagre list of entries for the A.C.G.B.I. Tyre Trials, we understand that these will be proceeded with, and thus afford bold advertisement to the two firms who have taken their chances under the auspices of the club.

In fact, these will be started on March 1st instead of Feb. 26th, as before arranged. The Wolseley Garage at Niagara has been placed at the service of the A.C.G.B.I. for these trials, and it is there where the cars engaged in the event will be placed each night, until the completion of the tests over the full 4,000 miles. The cars, upon which the entered tyres and devices will be fitted, are a 20-h.p. Dennis (also officially entered for endurance), a 20-h.p. Rolls-Royce, and a 28-h.p. Daimler. All these will be fitted with Collier tyres, two with the standard pattern, and the other with an experimental set with beaded edges. The Hartridge solid tyre set entered will be tried on a Leyland-Crossley omnibus, whilst a steam lurry may also be found "in the running." The nine speedometers entered, seven of which are arranged for right-hand wheels, will be distributed over the cars and 'bus, two of the devices being run probably for 2,000 miles only, each, a course necessitated by the lack of vehicles upon which to fix them. Six different routes will be traversed in rotation by the cars until the full distance is completed. These are: 1, through Oxford to North Leach and return, 165 miles; 2, to Dunchurch, viâ Holyhead Road, and return, 163 miles; 3, Peterborough and return, viâ North Road, 166 miles; 4, Berkhamsted to Banbury, down Sunrising Hill to point 7 miles from Stratford and return, 168½ miles; 5, through Marlborough to a point 4 miles further on the Bath Road, 157 miles; 6, along Exeter Road, through Egham and Basingstoke to Stonehenge, and return, 158½ miles. A shorter daily run will be arranged for the omnibus.

Circuit Européen.

A CONFERENCE is called in Paris for to-morrow (Sunday, February 25th) of the foreign club delegates to consider several matters of importance in regard to the regulations. Not the least important will be the desire in several quarters to suppress the carrying of "observers" by each car throughout the run—which, if passed, will unquestionably detract very greatly from the value of the tour as a guarantee to the public that all mishaps and causes of delay have been faithfully chronicled day by day.

A Millionaires' Race.

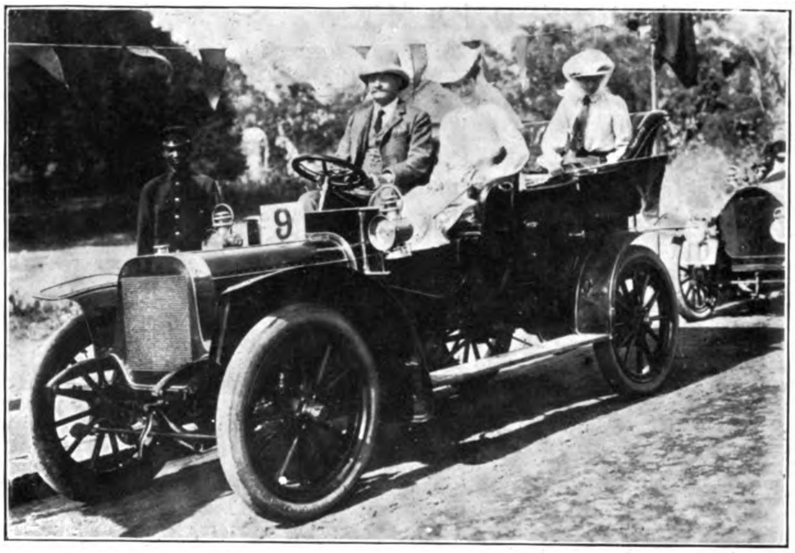
As a side attraction to the Havana long distance race, which we recorded last week, and in which Demogeot, on his Darracq, was the only "survivor," a "sporting event" for tourist cars was arranged to take place at the same time on the course, but only over a distance of 175 kiloms. This was for a pool of 15,000 dollars, between Julio Rabel, J. Aguilles, and Louis Marx, three millionaires, who finished as follows:—(1) Rabel (30-h.p. Bayard-Clement), 2h. 4m. 52s.; (2) Aguilles (30-h.p. Mors), 2h. 5m. 31s.; (3) Marx (40-h.p. Mercedes), 2h. 14m. 2s.

Gothenburg to Stockholm.

UNDER the auspices of the A.C. of Sweden, a competitive run was last week completed between Gothenburg and Stockholm. Seven starters were sent off on Feb. 15th at 7 a.m., as follows:—Bagge (7-h.p. Star), Salmson (24-h.p. Fiat), C. Skamberg (24-h.p. Cottereau), Grebst (12-h.p. Darracq), H. Dahn (12-h.p. Darracq), H. Pripp (12-h.p. Darracq), Petersen (7-h.p. Oldsmobile). The 24-h.p. Fiat was the first in, arriving in Stockholm at 9.46 a.m. on Feb. 16th, making a time of 26h. 46m. for 500 kilometres.

Competition of "Odotachymetres."

THIS is not a race for elephants or tapirs, as might have been suggested by the name to Mrs. Malaprop or her descendants, but refers to a competition of speed indicators, to which the A.C.F., in its wisdom, has assigned the above terrible appellation. Presumably, it is derived from two Greek words—most things that nobody can pronounce usually are—ὁδὸς and ταχὺς (road and swift), and might be translated "swift-road counters." The complete incomprehensibility of the title to anyone not acquainted with the language of Demosthenes is a further confirmation, if any were needed, of the schoolboy's theory that Greek was invented by schoolmasters to provide excuses for application of the rod. In addition, the word ought, on philological principles, to have been "odotachometer," from τάχος, swiftness. There will be prizes awarded in connection with the competition, the first prize going to the machine that combines capacity for showing the speed reached with a record of kilometres traversed. This prize has been offered by Baron Henri de Rothschild, and the Technical Committee of the A.C.F. has been engaged in elaborating a set of rules for regulating the competition. It is the same committee (among whose qualifications for testing speed-counters are said to be a knowledge of Greek) who have elaborated the above expressive, though scarcely euphemistic, denomination for the machine. The gentleman who wishes to stick to French roots for the word has, however, not done much better than the Hellenists implicated, for he puts forward "cheminovitessometre," which, by interpretation, signifieth (literally) "road-speed measurer," and has nothing to do with "chemises," as the unwary might be disposed to opine. After all, the English term has something to recommend it. The name actually adopted suffers, at any rate, from the objection that it might just as well mean a "quick road measurer" as a road and speed indicator, but such things are trifles to philologists and word-makers when they have got their spectacles on and their dictionaries in full swing.



Amongst the winners in the Motor Union of Western India Reliability Trial, of which a report appeared recently in the "Automotor Journal," was Dr. A. H. Deane's 16-20-h.p. Argyll car, which he drove himself, securing the Trophy Shield in Class C (cars costing from £400 to £600). Our photograph shows Dr. Deane at the wheel of his winning car.

The "Odotachymetre" Trial Rules.

RULES governing these French trials of speedometers and recorders have now been drawn up by the A.C. de France for the Academie des Sports. These provide that the contest shall commence on May 1st, entries at 50 francs to close on April 15th. Subject to less than three entries being received, the trials to be postponed. Competitors must provide cars with the devices attached. The judges will take into consideration—(1) the accuracy of record, (2) the ease of fixing, (3) the regularity of working and strength of the parts, (4) the weight and price.

The trial will consist of two tests, viz., (a) running twice on the Montgeron-Ozoir-la-Ferriere road, a distance of 100 kiloms., during which independent readings will be taken every 25 kiloms.; (b) a bench test in the laboratory.

Vienna to Gratz.

THE Austrian Automobile Club has arranged a reliability trial for light touring cars for the 12th and 13th of May, from Vienna to Gratz and back again, forming a total distance of 410 kiloms. The trial is confined to cars of a standard type driven by internal combustion engines. Single-cylinder motors are limited to a capacity of 1½ litres, 2-cylinder motors being allowed 2·5 litres capacity.

* * * *

The Agricultural Motor for Essex.

AT a recent meeting of her Essex tenants at Dunmow, the Countess of Warwick made some drastic remarks on the preferential treatment accorded to foreigners by British railway companies, and the result which it had produced of rendering profitable farming in the home counties difficult, if not impossible. The Countess recommended that the system she had adopted at her agricultural college at Studleigh, near Birmingham, of organising a motor transport service, should be employed in Essex, a proposal which was also supported by Mr. James Hewson. He, however, goes a step further, and proposes that the farmers should organise a motor transport service themselves, and that the service should consist, not merely of motor vehicles for carrying the produce, but of motor-propelled stalls for displaying the same for sale. The general adoption of systems of this kind would, in his opinion, soon bring all the "waste land" in England under cultivation.

The Automobile Export Trade of France.

STUPENDOUS are the figures which represent the *export* of automobiles and parts from France. For 1906 the figures are over 100,250,000 francs! As showing where they go to, the *imports* of automobiles and parts into Great Britain for the same period represent no less than £3,446,886 = 86,172,150 francs! The British *exports*, by way of contrast, total up to the comparative bagatelle of £544,028, or only a little more than the odd thousands in excess of the millions of imports. The export figures of France from 1897, when they were first issued separately, are given below, and show the remarkable progress made and the increasing expansion of France's trade in automobiles :—

		Francs.			Francs.
1897	...	623,690	1902	...	30,219,380
1898	...	1,749,350	1903	...	50,837,140
1899	...	4,259,330	1904	...	71,035,000
1900	...	6,617,000	1905	...	100,265,000
1901	...	15,782,000			

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THE IMPORTERS' PROTECTION ASSOCIATION, LIMITED.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I enclose a copy of a circular which is being sent to all the firms who are engaged in importing cars or accessories into this country.

The letter will explain itself, and I shall be glad to send particulars and form of application for membership on receipt of a letter to the address below.

I may say that the objects of the Association are in no way antagonistic to that of the Society of Motor Manufacturers and Traders, it being rather the policy of the Association to work in harmony with the Society. The Council of the Association includes several gentlemen who are members of the Committee of Management of the Society who have agreed to receive a deputation from the importers.

It is necessary, however, for the importers to combine in order to protect their interests. The British manufacturers have their Alliance, and the above Association will be recognised as the official organisation of the importers.

Yours faithfully,
H. B. COOK,
Secretary.

483, Oxford Street, W.
February 19th.

Excerpt from Letter enclosed :—

"The Importers' Protection Association, Limited, has been formed for the purpose of protecting the interests of importers of foreign motor cars and accessories, in order that, by combination and concerted action, importers in the motor trade may safeguard their interests and secure for themselves fair and just treatment in matters connected with the motor industry. It is felt that the formation of such an association is very necessary in consequence of the hostile and aggressive attitude adopted by the British Empire Motor Trades' Alliance towards the interests of importers of motor cars and accessories into this country, and the following firms have joined the Association and are represented on the council :—

Council of the Importers' Protection Association.

Firms.	Represented by
A. Darracq and Co., Ltd.	A. Rawlinson, Chairman.
Panhard and Levassor	W. Du Cros } Vice-Chairmen.
F.I.A.T. Motors, Ltd.	D'Arcy Baker
De Dion-Bouton, Ltd.	J. W. Stocks.
De Dietrich and Co., Ltd.	W. M. Letts.
A. Vedrine and Co., Ltd.	Chas. Jarrott.
Du Cros-Mercedes, Ltd.	Harvey Du Cros, jun.
Renault Frères, Ltd.	P. L. H. Dodson.
Mors, Ltd.	Cecil Banbury.
W. and G. Du Cros	Geo. Du Cros.
London and Parisian Motor Company, Ltd. (Hotchkiss).	B. D. Corbet.
Mann and Overton, Ltd. (Richard-Brasier).	J. Overton.
Minerva Motors, Ltd.	D. Citroen.
Donne and Willans, Ltd. (Rochet-Schneider)	Morgan Donne.
Germain Motor Company	Theo Masui.
Clement Motor Company, Ltd.	E. H. Lancaster.
Cannstatt Automobile Supply Association.	J. Clerk.
Gladiator Motor Company	A. McCormack.
Friswell, Ltd. (Peugeot)	C. Friswell.
London Motor Garage Company, Ltd. (C.G.V.).	Claud Watney.
Chenard-Walcker Motors, Ltd.	G. Oakey.
Fabry Automobile Company, Ltd. (Itala).	Maurice Fabry.
British Automobile Commercial Syndicate (Spyker).	Lord Shrewsbury.

Secretary and Office, pro tem : H. B. COOK, 483, Oxford Street, W.

Solicitors : KENNETH BROWN AND CO., 11, Pancras Lane, E.C.

You will realise from this list that the principal importers have already combined to protect the common interest of the motor importing trade, and I am instructed to ask whether you will join the Association and so identify your interests with those of the other importers, as it is felt that the moment is at hand when definite and concerted action may become necessary. You will appreciate that the effect of such action must be directly proportionate to the completeness of the identification of the interests of importing firms.

The Association is incorporated under the Companies' Acts, and is limited by guarantee, each member being liable in the event of the Association being wound up during the time he is a member or within one year afterwards to contribute a sum not exceeding £1.

The constitution of the Association admits of honorary members (for whom no special qualification is required) and ordinary members, the qualification for ordinary membership being the carrying on or being engaged in the business of importing motor cars or accessories as a principal."

AN HISTORICAL CAR.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have been applied to frequently for an illustration or photograph of the first motor car (internal combustion engine) built in Great Britain, without being able to comply with the request (since I had only one photograph of this car, and the only copy of this was hanging on the wall of one of the rooms of the A.C.G.B.I.). I have now made arrangements with the Autotype Company, of 74, New Oxford Street, to reproduce this photograph in their inimitable manner. I shall be glad to present one mounted and framed copy to automobile clubs, and will forward the picture, carefully packed and free of charge, on receipt of a request from the secretary or other official of the club. The only proviso I make is that the picture be hung in a clearly-visible place in the main room, and not placed anywhere out of sight.

If any well-known hotel or garage on the club list, or even a private individual, wishes to possess a mounted and framed copy of this photo, I shall be glad to forward the picture at cost price, or the photo mounted without the frame.

I have to express to those who have applied to me for an illustration of the first motor boat built in this country my regrets that I have no photograph now of this boat. This was built in 1891 (four years earlier than the car), was running on the river between Richmond and Wandsworth during the winter 1891–2, and was licensed in February 1892, so that it is most probable that some illustration of it would have appeared in some technical journal of the time.

Yours faithfully,
J. D. ROOTS.

Thanet House, Temple Bar.
Feb. 14th.

SIX-CYLINDER AND FOUR-CYLINDER CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I was very interested in reading the letter signed by Mr. Edge which appeared in your issue of the 17th inst. on "An Expert's Opinion on 6-cylinder Motors," and think the way in which Mr. Edge has worked in Herr Maybach's remarks is very clever. When I read the article, all that I understood Herr Maybach to say was that the 6-cylinder car was a good one for racing purposes, and I extract the following from Mr. Edge's letter :—"As he (Herr Maybach) says, 'I can only recognise the justification of the 6-cylinder motor in one case. When the driver wants to get along quickly, when he has to keep his hands on the wheel, when he has not time to change gears, or when a wrong manœuvre with the speed-lever might mean costly seconds, then the six cylinders, where the play with the throttle and advanced ignition permits of every speed variation, is fully justified.'"

I leave it to the readers of your paper to say whether this is wanted in a touring car, or whether it does not describe exactly what is wanted in a racing car. I think everyone agrees that a 6-cylinder car for a race has its advantages, and probably an 8-cylinder is better still, as has lately been demonstrated by the Darracq at Florida, and I think it is probable we shall see 6 and 8-cylinder racing cars this season. It must be admitted that the performance of the 8-cylinder Darracq at Florida means that it has beaten the 6-cylinder car, and if that is so why stop at six—why not have eight cylinders, or even twelve?

If I remember rightly, Captain Deasy, in a very sportsmanlike way, said that he was of an open mind as to whether a 4- or 6-cylinder was the better car of the two, and for this reason he would be glad to put his 4-cylinder car against a 6-cylinder. Mr. Edge immediately came forward and offered to put his 6-*cylinder racing car* in competition, to which Capt. Deasy naturally objected, as he wanted an ordinary touring 6-cylinder. Now, what I am anxious to see, and what I think the public at large are anxious to see, is the ordinary 6-cylinder touring car in open competition against the ordinary 4-cylinder touring car of the same horse-power and same cylinder capacity. All these marvellous letters on the 6-cylinder car mean nothing; let us see the actual 6-cylinder touring car in open competition with the 4-cylinder touring car—whether they are foreign or English, matters little.

If Mr. Edge would like to have expert opinions on the 6 cylinder motor I should say that the representative of the Mercedes would be happy to obtain Herr Maybach's full opinion, and if the constructors who are responsible for the designing of such cars as the Panhard, Charron, Renault, Richard-Brasier, De Dietrich, Daimler, Argyll, and Napier were to write their opinions upon the subject, I think it would be very interesting reading—far more so than the letters which have been appearing lately on this matter.

Yours faithfully,

February 19th. W. M. LETTS.

BRITISH CARS FOR CANADA.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have been asked by the A.C.G.B.I. to read a paper before them on March 1st (Thursday), entitled "Motor Trade with Canada."

They have asked me to do this because the first motor exhibitions in Canada are soon to be held: one in Toronto, March 31st to April 7th, and one in Montreal, April 21st to April 28th.

I have been requested by the Canadian people interested in these shows to point out the opportunities for opening up a trade in Canada for British cars. Acting as Commissioner for the British manufacturers, I expect to sail with the cars from Liverpool on the "Lake Manitoba," Tuesday, March 13th.

Briefly, the reasons why a good trade with Canada can be opened up in motor cars are these:—

First: About 3,000 American cars have been sold in Canada last year, and are giving so much trouble to their present owners that they are desirous of getting rid of them and want to "go in for motoring." The British cars will suit them, and are admitted into the Canadian market at a third less tariff than those of any other country, including the United States. As the duty is 35 per cent., this is, roughly speaking, a preference of 12 per cent. in favour of British cars.

Second: The great and increasing prosperity of Canada makes Canadians want good motor cars, and enables them to pay for them.

The British cars for these shows will be admitted duty free, and the duty need not be paid unless the cars are sold.

I am assured, however, that the cars will be sold, as people from all over Canada will attend these shows, and will be anxious to take up agencies for the sale of them in the future.

I hope that you will give the wide publicity to these facts which a journal of your great circulation can do, and thereby assist the manufacturers of British motor cars to grasp the right hand of fellowship that Canada is holding forth to them in her preferential tariff.

Further information to those interested, and entry forms will be furnished on application to me, at 272, Birkbeck Chambers, Holborn, W.C.

Faithfully yours,

February 19th, 1906. E. H. TURNBULL.

THE FLYING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Perhaps I did not make myself quite clear, as Mr. Roe appears to have been doubtful as to the construction to be placed on a portion of my letter.

My contention is that the aeroplane, even when fitted with a propeller, is too erratic and uncontrollable to ever become a satisfactory and safe means of aerial navigation. It requires some other device or mechanism to render it more dirigible and controllable.

The reasons for this are as follows:—

1. Assuming that an aeroplane were aloft, loaded with passengers, and travelling at, say, 20 miles an hour, and that there were no wind or only a light one of, say, 5 miles an hour, and something happened to the engine or the propeller-shaft, the chances of the machine or the passengers reaching earth safely would be remote indeed.

2. A car on wheels, or something the equivalent of it, is necessary to permit the aeroplane to start, and a considerable length of run would be necessary in a machine of larger size, as it requires a wind of 18 miles an hour to lift the aeroplane. A wind of 18 miles an hour in perfectly open country might suddenly drop to five in places sheltered by houses and trees.

3. The aeroplane necessarily requires considerable space in which to start and alight, as in order to effect these operations easily it must travel in a line only a few degrees from the horizontal, and with buildings in the neighbourhood the machine might, while moving slowly, suddenly encounter a deflected or cross current and capsize.

4. In a gusty wind the aeroplane, as I have found from my own models, is very erratically inclined. It may on six consecutive occasions glide perfectly smoothly and in accordance with expectations, and on the seventh either glide directly for the earth, or it may in a gusty wind or if it meets a cross current behave like a piece of paper in the wind or a tumbling pigeon. Without placing too much reliance on results obtained with models, I think that to give a certain degree of safety (complete safety can only come through the process known as "trial and error" in the air), some direct lifting mechanism is necessary, as also something in the nature of a parachute to prevent a too rapid descent in case of any failure of the engine or propeller-shaft.

I quite agree with Mr. Roe that it is possible to fit a vane to an aeroplane which should act in a somewhat similar manner to a downwardly-turned bird's tail for arresting forward motion, but for the reasons before given I do not think there can be the necessary degree of control and dirigibility to render the aeroplane alone a safe working aerial machine. The aeroplane requires the addition of some device giving a more direct and definite control.

Yours faithfully,

February 19th. J. D. ROOTS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In answer to Mica Cam's letter, my model illustrated is to scale, and is one-twelfth the size of the Wrights' latest machine, but only has 145th of the surface area, and consequently the weight should be 145 times less, which it easily comes under, namely, three-quarters of a pound.

I understand the Wrights' latest machine had eight vertical struts, two propellers with a rudder at the back of each, the engine and weight being on a plane above the lower, and much below the upper carrying surface. They found by carrying the weight below this point, that is below the centre of gravity, there was a tendency for the machine to wobble.

Mica Cam points out that the model illustrated, if made full size, would lose one of the Wrights' distinctive features, namely, reduction of friction, but I fail to see why this should be so, for when making full size one would naturally arrange all the struts, &c., as fine as possible. In the model shown the struts are of sharp oval section in order to offer as little resistance to the wind as possible.

However, this summer should witness some interesting experiments with full size machines, then all these points can be thoroughly gone into in a practical way.

Yours faithfully,

A. V. ROE.

The Trophy Shield Secured by Mr. Deane with his Argyll Car, in Class C, of the Indian Motor Union Reliability Trial.

CLUBS AND ASSOCIATIONS.

Aero Club.

THE following have been elected to the New Meteorological Committee of the Club:—Sir Norman Lockyer, the Hon. C. S. Rolls, Professor Huntington, Mr. Roger Wallace, Mr. Pollock, Mr. Dines, F.R.S., Mr. Alexander. This committee has arranged to work in conjunction with the Royal Meteorological Society, with a view to carrying on a series of balloon ascents for the purpose of the scientific research of the higher atmosphere by means of observations and experiments and continuous, in fact, with the work done by the late Mr. Jas. Glaisher, F.R.S., in Coxwell's balloon in the latter part of the last century. The Technical Committee of the Aero Club, whose principal functions are the investigation of aeroplanes and flying machines of the heavier-than-air type, has been constituted for 1906, as follows:—Sir Hiram Maxim, the Hon. C. S. Rolls, Sir H. E. Colville, Major Baden-Powell, Colonel J. E. Capper, Mr. Frost, Mr. Pollock, Mr. Alexander, Mr. Spencer, Mr. Sims, Mr. Wallace, K.C., Mr. Moore-Brabazon, Dr. Hutchinson, Professor Huntington. Some interesting competitions in connection with this important branch of aeronautics are to be organised by this committee.

Automobile Association.

A MEETING of the association has been arranged to be held on March 26th at 4 p.m., at Cordingley's Motor Car Exhibition at the Agricultural Hall. *All* interested in motoring are invited to attend.

British Empire Motor Trades Alliance, Limited.

THE Dunlop Pneumatic Tyre Company, Limited, have promised a donation of twenty guineas to the Alliance's Foundation Fund. The following firms have recently been elected to membership:—Horsfall and Bickham, North British Rubber Company, Limited, Edwin Richards and Sons, Rover Company, Limited, Laurie and Marner, Limited, Willans and Robinson, Limited.

British Motor Boat Club.

THE annual general meeting of this club, we are informed, will be held on Tuesday, Feb. 27th, in the Club Room, Craven Hotel, Charing Cross, W.C., at 5 p.m., instead of on the 23rd as previously announced.

The club held at its headquarters, Craven Hotel, Charing Cross, last week, an Informal Dinner, after which Lieut. Windham, R.N., read a Paper on the "Practical Handling of Motor Boats," which he illustrated with lantern slides, some of which showed his work in connection with the lifeboats on the West Coast of Ireland, and elsewhere.

Lieut. Windham opened his lecture by pointing out the absolute necessity for some practical nautical knowledge on the part of those handling motor boats, and feared that unless motor boating was taken up in a somewhat more serious manner than motoring is to-day, thrilling accidents would happen.

The form of petrol engine best fitted for motor boat requirements was then dealt with. To ensure each piston getting its proper amount of lubrication, the crank-chamber should be divided into two if not four sections, to prevent the oil in the crank-chamber from flooding one cylinder, fouling plugs, and stopping the engine. Marine motors require more lubrication than those on cars. Special provisions are also required for the water circulation, for the reason that no radiators are required. Pumps should be used, slow running for preference, but not working on the principle of those fitted to cars. In fitting them, means have to be provided for preventing the choking of the grating leading to the water pipes, by seaweed.

Petrol tanks must have larger capacity than those on cars, and as head-winds and head-seas may delay the boat, spare tins of petrol must always be carried. Leakages in the fuel-feed piping should be strictly guarded against. The clutch and fly-wheel should be heavier than those fitted in cars—the momentum of the road-wheels of a car being absent. A low-tension magneto is preferable to accumulators, but every boat should have two independent sources of ignition.

With regard to the propeller, the number of blades is of great importance. Lieut. Windham preferred two blades, but three were easier to balance. Phosphor-bronze is preferable to steel.

For the hull, wood is far preferable to steel, for not only is the latter liable to leak, but it is more difficult to keep clean.

Climatic conditions must be studied in ordering motor boats, and reverting to the engine, the sparking plugs must be capable of being removed while the engine is running. Floor boards should be covered with non-slipping material, and every boat should carry an anchor, a cable for hauling and towing, and a sea anchor. He had not had happy experiences with paraffin carburettors.

Seamanship was a very desirable accomplishment for a motor boat owner, in order that he could know how to pass other boats. After giving information on this point, the necessity for knowing how to read a chart was dwelt upon.

Other heads of the lecture were devoted to steering, the necessity for carrying a compass, the kind of compass to use, and how to find the error of deviation in compasses.

How to run in broken water was another subject dealt with in detail by Lieut. Windham, who observed that every motor boat owner ought to go to the trouble of learning a few things connected with the sea.

After Lieut. Windham had concluded his paper and shown various other slides, Mr. Arthur Evans (who was in charge of Napier Major on her long trip last year) exhibited a number of his slides, showing racing motor boats and the historical aspect of the motor boat movement.

Lincolnshire A.C.

AT the annual general meeting of the club, when the president, Sir Hickman Bacon, Bart, occupied the chair, the membership was announced to be 170, and the accounts proved to be in a satisfactory condition. The resignation of Dr. Cragg, the indefatigable hon. secretary, was announced, and accepted with much regret, but it was recognised that, owing to Dr. Cragg's increasing practice, and the heavy work of the club, it was impossible for him to carry on the duties any longer.

The officers of the club were elected as follows:—

President: Sir Hickman Bacon, Bart.

Vice-Presidents: Right Hon. Earl Brownlow, Lord Willoughby de Eresby, M.P.; Mr. W. Garfit, J.P.; Mr. Eric Chaplin; Captain J. A. Cole, J.P.; Mr. M. R. Waldo Sibthorp, J.P.; Mr. C. J. E. Parker, J.P.; Mr. C. W. Pennell, J.P.; Colonel Ruston, J.P.; and Mr. J. D. Sandars, D.L., J.P.

Committee: Mr. A. A. Padley, Mr. W. R. Pennell, Dr. Gilpin, Mr. G. Godson, Dr. Miller, Captain Gleed, Dr. Cragg, Captain Newsum, Mr. W. B. Jevons, Dr. Mason, Mr. W. A. Tomlinson, and Mr. R. Fowler.

Hon. Solicitor: Mr. C. Nelson. *Hon. Secretary:* Mr. Godfrey Lowe, St. Catherine's, Lincoln.

Manchester A.C.

THE annual dinner of the club will be held at the Midland Hotel, Manchester, on March 10th. The following gentlemen have already promised to be guests of the club on that occasion:—The Lord Mayor of Manchester, the Mayor of Salford, His Honour Vice-Chancellor Leigh-Clare, and Mr. C. A. Cripps, K.C.

Scottish A.C. (Western Section).

AN enthusiastic gathering of the members of this club took place on Monday night in the Grosvenor Restaurant, Glasgow, the occasion combining the annual dinner of the club and a complimentary banquet to the Right Hon. Sir J. H. A. Macdonald, K.C.B., Lord Chief Justice Clerk of Scotland, in recognition of his services as President of the club. The chair was occupied by the Right Hon. Sir Herbert Maxwell, Bart.; Mr. John Adam, the chairman of the Western Section, and Mr. H. M. Napier, chairman of the General Council, undertaking the duties of croupiers. About 170 guests were present, these including the Marquis of Ailsa, Sir Samuel Chisholm, Bart.; Sir John Ure Primrose, Bart; Comte Louis de Clercq, Sheriff Boyd, Councillors Hugh Alexander and Cleland, Mr. John D. Macdonald, Professor Archibald Barr, Capt. Bennett, and Mr. Hugh Reid. "Our Guests," which was the toast of the evening, under the circumstances of the complimentary banquet to the Lord Justice Clerk, was, after being eloquently proposed by the chairman, needless to say, very enthusiastically received.

The Lord Justice Clerk, in responding in his usual humorous, albeit very earnest and convincing manner, said the truth in regard to motor cars must prevail. He looked upon automobilism not so much as a sport but as being of enormous value towards the development of the commerce and the agriculture of the country. He did not think many had much conception of the enormous effect it would have upon the wealth of the country, upon the prosperity of the country, upon the development, once for all, of the road as an interesting place, upon country inns and the people who administered to the country inn. He further advocated consideration of all users of the road one to another, and hoped that all racing at abnormal speeds might be relegated to America, rather than its further development should be encouraged in this country.

In the course of the evening a very pleasant function was performed in the presentation to Mr. Robert J. Smith, the hon. secretary, of a silver centrepiece in recognition of his services to the club.

Sheffield A.C.

AT the Annual General Meeting of the club, the following officers were elected for the ensuing year:—*President*, the Right Hon. the Earl of Effingham. *Vice-Presidents*, Messrs. Herbert Barber, E. F. Coupe, Harvey Foster, D. Gilmour, J. H. Pickford, and T. Wilkinson. *Committee*, Messrs. Jas. Barber, P. J. Benson, T. H. Firth, G. D. Flather, E. W. Hatfield, Ben Hind, W. Robinson, G. E. Senior, Dr. Thorne, and Mr. J. R. Wade. *Hon. Treasurer*, Mr. E. F. Coupe; *Hon. Secretary*, F. B. Cawood.

The Automobile Club and the Trade.

AT the first council meeting of the Society of Motor Manufacturers and Traders in their new premises, Maxwell House, Arundel Street, we understand that the chief item under consideration was the proposed arrangement between the Society and the Automobile Club, which is calculated not only to remove any possibility of friction between the club and the trade, but also to advance the general interests of the motor movement.

MOTOR CYCLING.

Land's End to John o' Groats Trial.

AT the last meeting of the Auto-Cycle Club Sub-committee the following recommendations were made:—

Awards.—That a special prize, which has been promised, be awarded to the trade rider who adheres to the daily schedule and accomplishes the best performance throughout the Trial. In addition to the usual awards, a bronze medal to be awarded to each rider who finishes at John o' Groats, together with a certificate of the performance.

Eligible Machines.—That any four-wheeled motor vehicle, where the passengers are seated one in front of the other, be eligible to compete in this Trial as a motor cycle.

Closing of Entries.—That entries close on Monday, May 14th, at the ordinary fees, but later entries will be received up to May 25th at an increase of 50 per cent.

Silencers.—That efficient silencers must be fitted to all machines. No cut-outs to be used, and if fitted to the machines, they will be sealed, so that they cannot be used.

Accessories.—It is suggested that this is an excellent opportunity to accessory manufacturers to have speed gears, speedometers, magnetos, luggage carriers, &c., officially observed and reported upon, and the sub-committee recommend that this be undertaken.

The International Cup and the French Club.

WE have never altogether admired the sporting principles which prevail on the other side of the Channel. French automobilists and French motor bicyclists are as charming as possible when they win. To keep them charming they must win everything. If they fail to do this, they usually commence a campaign for the purpose of annihilating the competition in which they have proved unsuccessful. There is something about the whole business reminiscent, not of the school, but of the nursery, in which the children who have been defeated in any particular game refuse to play that game any longer. We are referring, of course, to the International Motor Cycle Cup Race, originated by the Moto Cycle Club de France, and this year to be run in the country of the holders of the cup, viz., Austria. Last year this event was the "Gordon-Bennett" of the motor cycling world, and this it would have remained, no doubt, as long as French competitors won it. But last year an Austrian competitor carried off the prize, and now, as we stated three weeks ago, all the leading motor cycle manufacturers of France are refusing to enter for this year's event, only one French competitor, the Gillet firm, being whipped up at the last moment. As we announced in the same issue of THE AUTOMOTOR JOURNAL, the Moto Club of France simultaneously decided to arrange an International Motor Cycle Championship for the end of May. We commented then upon the obvious "squeezing out" tactics which were again apparent in this move of the French Club. Presumably, this contest will be arranged so that Frenchmen may carry off the palm. If it should so happen, in spite of everything, that it is won by a foreigner, we may anticipate with perfect certainty that the event will be abandoned next year, and another event, even more favourable to French competitors, organised. In fact, methods of winning cheap glory seem to have been reduced to a fine art by the French at the present day. In justice to the history of the French nation, one is glad to admit that it was not ever thus.

A Strong Protest from Austria.

OUR remarks in regard to the action of the French Club appear to be now echoed by those most interested in the sport. These manœuvres and tactics have evoked a strong protest from the Motor Cyclist Union of Austria. After a general protest the Austrian Motor Cyclists' Union proceeds:—

> "The Moto Cycle Club of France has determined to be represented at the test this year only by a single firm, as yet practically unknown in international competitions. At the same time it has officially decided to organise an International Championship, to take place a month before the race for the Cup."

The Austrians further express their astonishment that the French should have alleged the long distance and great cost of competing in Austria as a reason for their action, and observe very naturally that it is just the same distance from France to Vienna as it was last year from Vienna to Paris. The letter of the Austrian Union concludes with the following forcible observations, which we reproduce:—

> "We have nothing to say to the races which you intend organising or to their date, but there are traditional laws of international courtesy and of sporting custom which a nation of the importance of the French is specially bound to respect. It was France which created the International Cup, and the idea of the founders was to organise a sporting event which would enable national industries to prove their superiority by generous and pacific competition.
>
> "We are convinced that an appeal to your sporting sentiments will result in persuading you to abandon the International Championship in favour of the International Cup, or to at any rate adjourn it to another date."

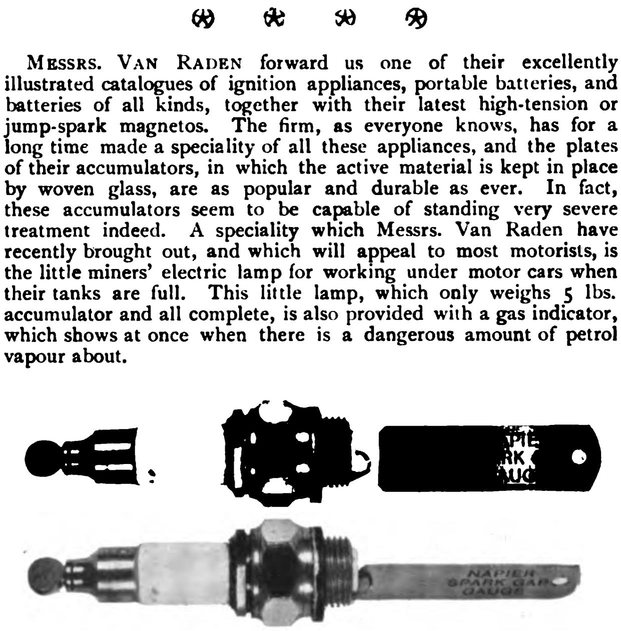
Are they?

Motor Cycles for the Army.

A VERY important departure has been made by the new Secretary of State for War, in ordering motor cycles for military purposes. The Motor Volunteer Corps has given such an excellent account of itself at manœuvres in recent years, that the importance of the motor bicycle has been fully recognised by all the military experts. That the experience gained should be given practical expression in this way by the new head of the department is an encouraging symptom. An order has been placed for the motor cycles with A. W. Wall, Limited, of Guildford. The machines are to be of the low-built type, so that the rider can easily reach the ground with either foot. There will be no pedals, but a friction-clutch permits of starting the engine in the same way as with a car. The horse-power of the engines, which will be single-cylinder, will be about 4-h.p.

* * * *

MESSRS. VAN RADEN forward us one of their excellently illustrated catalogues of ignition appliances, portable batteries, and batteries of all kinds, together with their latest high-tension or jump-spark magnetos. The firm, as everyone knows, has for a long time made a speciality of all these appliances, and the plates of their accumulators, in which the active material is kept in place by woven glass, are as popular and durable as ever. In fact, these accumulators seem to be capable of standing very severe treatment indeed. A speciality which Messrs. Van Raden have recently brought out, and which will appeal to most motorists, is the little miners' electric lamp for working under motor cars when their tanks are full. This little lamp, which only weighs 5 lbs. accumulator and all complete, is also provided with a gas indicator, which shows at once when there is a dangerous amount of petrol vapour about.



In order to enable the distance between the spark-points of an ignition-plug to be correctly adjusted on Napier engines, Mr. S. F. Edge has recently introduced the special gauge of which we give two views above. These illustrations well indicate the manner in which this simple little device is intended to be used.

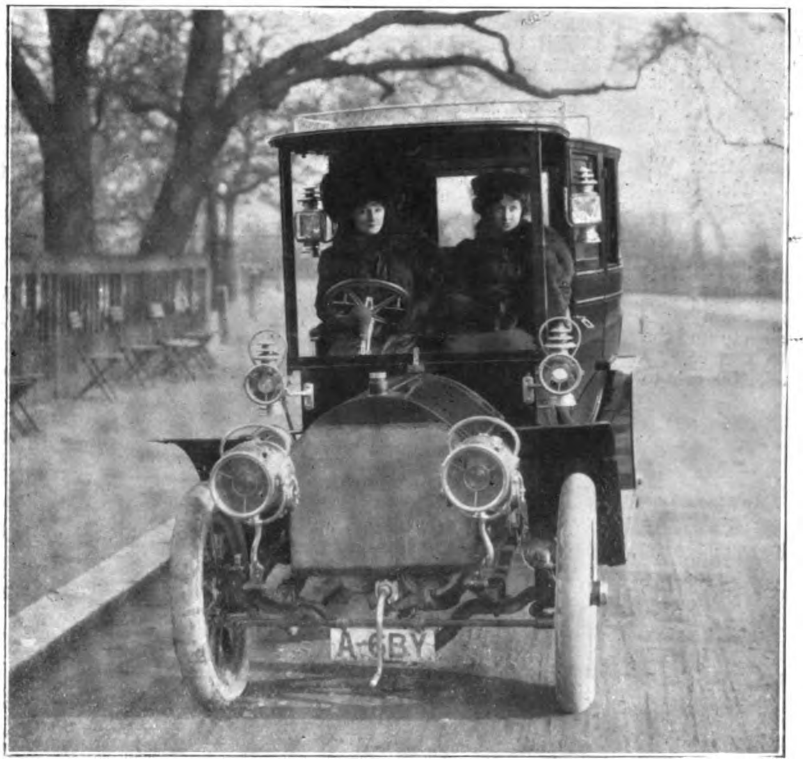


Photo by Bassano.

The Marchioness Townshend at the wheel of a 1906 type 25-30-h.p. Ariel Limousine Car.

A Trained Baby, and a Point of Law.

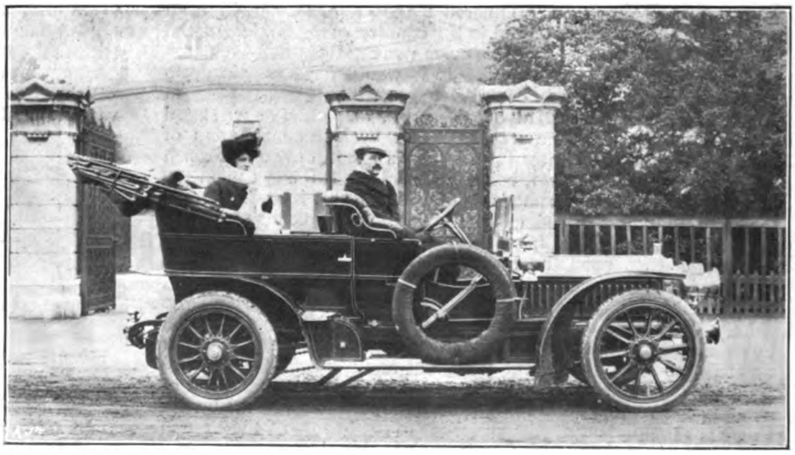
A BABY who has a proclivity for tearing inconvenient endorsements off licences, should prove nearly as useful to automobilists "with a past" as the children on the Ripley Road used to be to Sergeant Jarrett. Francis Forest, of Carrington Street, Mayfair, was summoned at Bow Street for driving a motor car in St. James's Park beyond the regulation speed. Defendant's licence was produced in Court, and the magistrate observed that a portion of it was torn off. The defendant explained that this feat had been performed by his baby, and the case was adjourned that the baby might disgorge the missing portion, which it was admitted contained an endorsement. We take this opportunity of once again pointing out (though there seems to be little good in doing so) that an accused person is not bound to produce his licence in Court until he has been convicted. Having been convicted he must produce the licence within a reasonable time (and a magistrate has said a reasonable time would be seven days) to have the particulars of the conviction endorsed upon it. But he is not bound to produce it before. This is in accordance with the principle of English criminal procedure that previous convictions must not be adduced against an accused person until he has been found guilty of the charge. It is a course that is very frequently departed from in practice, but it is the law all the same. Records of previous convictions, which is what endorsements are, should only be referred to in order to determine the punishment to be inflicted and can never legally be used as presumptive evidence of guilt. This, however, is a fact persistently ignored by the police, who insist on asking for licences as soon as the unfortunate motorist is brought into Court. The motorist should absolutely refuse to accede to this demand, as the attempts made by the police to force him to produce his licence before the case is heard are a gross abuse of their authority. However, it often helps them in obtaining convictions, and that is all *they* care about.

Mr. Cathcart Wason, M.P.

THERE are advantages in contesting the remote constituency of Orkney and Shetland. Reminiscent of ancient times, when it took a considerable period to get there, this constituency polls last of all, and the intending members have consequently ample time to see how the political cat is jumping in the rest of the country. It was as a member of the House of Commons, noted for his hostility to the automobile, that Mr. Cathcart Wason was principally known outside that assemblage. In the last Parliament he was a Conservative, but he realised how completely popular feeling had changed, doubtless by reading the results of other elections in the daily papers, and wisely he changed with it. The quondam Conservative is now a Liberal, and in consequence retains his seat for Orkney and Shetland. Whether he bears a coat of arms we do not know, but if he is in want of a suitable motto we would suggest the old one about *tempora mutantur et nos*, &c. While changing his political opinions we trust Mr. Cathcart Wason has also changed his opinions in regard to the automobile. The automobile boat, at any rate, would be useful in his constituency.

Rise, Sir Fletcher Moulton, Lord Justice.

LORD JUSTICE MOULTON last week had the honour of a knighthood conferred upon him.



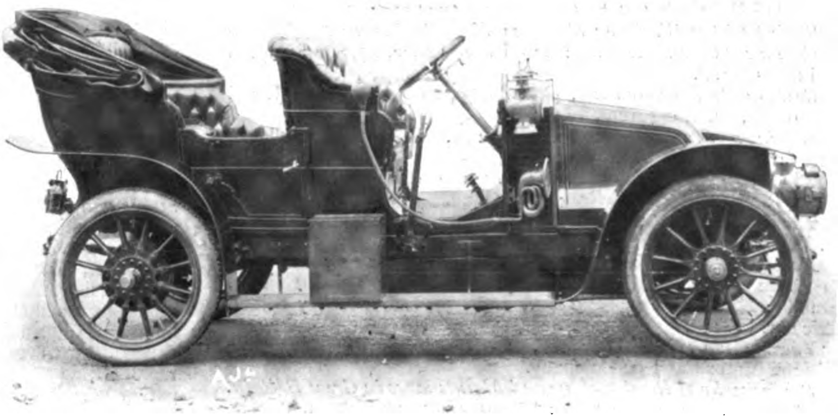
Viscount Royston and his recently-acquired 40-h.p. 6-cylinder Napier touring car. Accompanying Viscount Royston is his sister, Lady Susan Yorke, so well known as a brilliant amateur actress.

The Motor Horn Abuse.

IN Holland a new law forbids the use, by "push cyclists," of the motor horn.

A Testimonial to the "Yellow Cover."

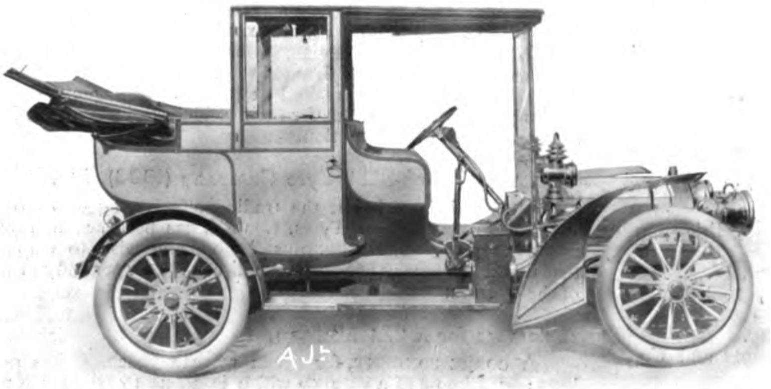
A NUMBER of books, according to a notification in the club *Journal*, have disappeared from the shelves of the Automobile Club Library, somebody apparently having chosen to overlook the information, with which he was doubtless furnished, that the library is not a lending institution. Among the various works which have disappeared are, we notice, the first three bound volumes of THE AUTOMOTOR JOURNAL, a proof that this particular "borrower" knew what he was about, and picked out volumes which have been long recognised as among the classics of automobile literature. We heartily endorse the request in the club *Journal*, that any member who, in ignorance of the rule against removing books from the library, "may have borrowed the volumes specified," will return them forthwith.



A handsome 35-h.p. Renault Car.—This Vehicle is one of the very latest models turned out from the works, and is—like all the Renault cars—remarkable for its smooth and silent running. In appearance, too, it follows the same lines as the other well-known models, having the radiator fitted close up to the dashboard and a very sloping bonnet. Its four cylinders have a bore of 130 mm. with a stroke of 140 mm., and, at the normal engine-speed of 700 revs. per min., the car is geared to 12, 30, 45 and 66 miles per hour on its respective "speeds."

The Automobile Club and the Motor Union.

A REGULAR working agreement between the Club and the Union has now been reached, which will for most purposes constitute the two organisations one body, but in which the responsibilities and duties of each are clearly defined. The relations between the Club and the Union will be regulated by a Standing Joint Committee of ten members, five to be nominated by each body, with a chairman. The Union will uphold and assist the Club in all disciplinary measures dealing with the conduct of motorists, and in all matters connected with trials and competitions, but the Club will refer cases of prosecution to the Union and support its action. In future, all agreements with local motorists and provincial clubs will be made by the Motor Union in the names of the two bodies in common.



One of the latest Italian firms to take up the manufacture of high-class petrol vehicles is the Societa Torinese Automobili Rapid, whose vehicles were, it will be remembered, shown at the last Paris Salon. Our illustration shows one of the 30-40-h.p. Landaulette Limousines, this being one of the more powerful "Rapid" models. Other standard types are those of 12-h.p., 20-30-h.p., and 50-70-h.p. Messrs. Straker and McConnell, who have recently been appointed the English agents, will have the handling of these new models.

How to Promote Gymkhanas.

THE Motor Union informs us that they have prepared a statement of hints and suggestions for the conduct of motor car gymkhanas. These suggestions have been circulated to the various clubs included in the membership of the Union for their information and guidance.

Gymkhanas are increasing in popularity among local clubs, as they are free from the disadvantages necessarily attendant upon club runs.

A copy of the suggestions can be obtained on application to the Secretary of the Union, 1, Albemarle Street, Piccadilly, London, W.

A Mile of Trams.

WE are always having fresh object-lessons in that peculiar characteristic of the electric tram, that if anything happens to stop one of the vehicles the whole line is blocked, and jammed for miles. One day last week a large furniture van was overthrown on the tramway line on Clapham Road. Before the van could be moved, the furniture had to be dragged out and placed on the pavement, an occupation which took up nearly an hour, at the end of which period there was a nice little muster of electric tramcars of over a mile in length standing end to end, partially deserted by their passengers, while even the most patient of those who were waiting for the furniture-van and the other tramcars to roll by were giving forcible vent to their feelings in language more picturesque than polite.

PUBLICATIONS RECEIVED.

Subject List of Works on Heat and Heat-Engines in the Library of the Patent Office. London: The Patent Office, 25, Southampton Buildings, W.C.

Coachbuilders' Art Journal, Desk Diary, 1906. London: J. and C. Cooper, 64, Long Acre, W.C.

Willing's Press Guide. London: J. Willing Junr., Ltd., 125, Strand, W.C. Price 1*s.*

The Eisemann High Tension Magneto (Reprint). London: G. T. Riches and Co., 4, Gray's Inn Road.

The Writers' and Artists' Year-Book, 1906. London: A. and C. Black. Price 1*s.* net.

De Dion-Bouton Motor Carriages: Their Mechanism and How to Drive Them. Edited by R. J. Mecredy. Third Edition. Dublin: Mecredy, Percy and Co., Ltd., 34, Lower Abbey Street. Price 2*s.* 6*d.* net.

The "Auto Era," January, 1906. Cleveland, Ohio: The Winton Motor Carriage Company.

Bibliography of Road Making and Maintenance in Great Britain. By S. and B. Webb. London: The Roads Improvement Association, 1, Albemarle Street, W. Price, 6*d.*

Electric Power: What It Is and What It Can Do. By A. W. Marshall, M.I.M.E., &c. London: Percival Marshall and Co., 26, Poppin's Court, Fleet Street. Price 3*d.* net.

The Engineer's Pocket Dictionary. French-English. By M. Lvoff. London: Percival Marshall and Co., 26, Poppin's Court, E.C. Price 1*s.* 6*d.* net.

The Steam Engine Indicator and Indicator Diagrams. By W. Worby Beaumont, M.I.C.E., &c. Second Edition, revised and enlarged. London: "The Electrician" Printing and Publishing Co., Ltd., Salisbury Court, E.C. Price 6*s.* net.

Patents to Inventors. By A. H. Stanley. London: Percival Marshall and Co. Price 3*d.* net.

Frenzied Finance, by Thomas W. Lawson. London: W. Heinemann.

Spalding's Athletic Library. How to Punch the Bag. By Young Corbett. London: British Sports Publishing Co., 2, Hind Court, E.C.

Catalogues.

Rolls-Royce, 1906. C. S. Rolls and Co., 14–15, Conduit Street, W.

Renault Freres, 1906. MM. Renault Freres, Billancourt (Seine), France.

"*Roc*" *Motors.* A. W. Wall, Ltd., Guildford.

Springs. List No. 14. Herbert Terry and Sons, Redditch.

Motor Accessories: Spare Parts, 1906. No. 5. G. T. Riches and Co., 4, Gray's Inn Road, W.C. Price 3*d.*

Pope-Hartford Automobiles, 1906. The Pope Manufacturing Company, Hartford, Conn., U.S.A.

The "Maxwell." F. W. Peckham Motor Syndicate, 40–41, Sackville Street, Piccadilly, W.

Rochet and Schneider, 1906. *Catalogue No.* 46. Donne and Willans, Ltd., 29a, Gillingham Street, S.W.

Dunlop Tyres for Motor Cars. The Dunlop Pneumatic Tyre Company, Ltd., 14, Regent Street, S.W.

Hallamshire Cars, 1906. Durham, Churchill and Co., Sheffield.

Imperial Specialities. G. Davenport and Co., 108, Hatton Garden, E.C.

Accessories. De Dion Bouton, Ltd., 10, Great Marlborough Street, W.

Jackson Cars. R. Reynold Jackson and Co., Ltd., 11, High Street, Notting Hill Gate, W.

1906 *Silent Sunbeam.* Sunbeam Motor Car Co., Ltd., Wolverhampton.

Argylls, 1906, *Bulletin* 26. Argyll Motors, Ltd., Bridgeton, Glasgow.

Posters. W. H. Smith and Son, 12, Norfolk Street, W.C.

Imperial Specialities. G. Davenport and Co., 108, Hatton Garden, E.C.

"*Scout*" *Cars.* Dean and Burden Bros., Salisbury.

Vosper's Paraffin Marine Motor (*No.* 67). Vosper and Co., Ltd., Broad Street, Portsmouth.

Vosper's Boats and Motor Launches (*No.* 66). Vosper and Co., Ltd., Portsmouth.

LEGAL INTELLIGENCE.

The Alleged "Motor School" Frauds.

AT the Westminster Police Court on the 15th inst., Riski Medawar and John Raymond Kerr were committed for trial on charges of conspiring to obtain money by false pretences in connection with an instruction school at Victoria Street, S.W.

COMMERCIAL POINTS.

H.-F. Vulcanizers in the West-End.

FOR some time past, Messrs. Harvey-Frost and Co., Ltd., have received at their head establishment in Great Eastern Street, a large number of applications, for free demonstrations in tyre-repairing, from people resident in the West of London and its environs, and as these applications are increasing daily, the firm is opening showrooms at 215, Shaftesbury Avenue (New Oxford Street end), to enable applicants to witness the demonstrations without making a journey to Great Eastern Street All the H.-F. vulcanizers will be on exhibition, including the popular little "car" vulcanizer, for carrying on car, and for executing tyre repairs by the wayside, as well as the other H.-F. appliances which the motoring public in London and elsewhere have so largely adopted. An important feature of the new showrooms is the free demonstration department, where any interested person may walk in and see tyre repairs being executed by the H.-F. process, and without any obligation whatever to purchase. This department will be a great convenience to those whose time is limited, and who find a journey to Great Eastern Street somewhat inconvenient. Specimen repairs by the H.-F. process will be available, every assistance will be given, and free inspection of the H.-F. vulcanizers and the H.-F. process will be allowed to anyone who calls. This development should inspire confidence between Messrs. Harvey-Frost and Co., Ltd., and prospective customers in the western districts of the Metropolis.

Municipal Motor Vehicles Wanted.

THE Twickenham Urban District Council have invited tenders, we learn through the British Empire Motor Trades Alliance, Limited, for the supply of the following:—One steam wagon, fitted with interchangeable bodies for street watering and cartage of materials and house refuse; six tipping wagons for the collection of house refuse. Further particulars can be obtained on application to Mr. Fred W. Pearce, F.S.I., Surveyor to the Council, Town Hall, Twickenham.

A Scotch Festival.

THE employees of the New Arrol-Johnston Car Company, Ltd., Paisley, held their first annual supper and dance in the George A. Clark Town Hall on Friday last week. Some four hundred guests were present. Mr. John S. Napier, the managing director, occupied the chair. After supper, Mr. D. B. Wright, foreman of the repair works, in proposing the toast of "The Firm," called attention to the remarkable equipment possessed by the Company for the production of motor vehicles of the highest grade, instancing the victories of the cars in the Glasgow Cup Competition and the Tourist Trophy Race as evidence of the sterling qualities of the vehicles. Mr. Napier, in responding, said, among other interesting things, that the firm was in the unique position of having designed, built, and had running on the road, three distinct types of cars within the past ten months, whilst a fourth model was now practically complete. A vote of thanks to the chairman, coupled with the name of Mrs. Napier for her presence at the function, was proposed by Mr. E. F. Robertson, assistant works manager, in acknowledgment of which Mr. Napier thanked the talented ladies and gentlemen who had sung and recited at intervals throughout the proceedings, and the committee for their assiduous efforts in making so signal a success of the function.

"Bettoruss" Non-Skid Tyre Company (1906), Ltd.

WE are informed that the trading name and goodwill of the late Bettoruss Non-Skid Tyres, Limited, has been acquired by the above company. The "Bettoruss" Company wish to emphasise that the new company has not on its directorate or staff any member of the old firm.

A Chance for a "Live" Man.

A CORRESPONDENT, for whom we can vouch, writes as follows:—"I know of a vacancy which is about to arise for a really smart man who can take a position as chief assistant in a motor depôt. It is a really good opening, indeed one of the best I have come across, for anyone who is (1) a good salesman; (2) a practical motorist. If you can insert a paragraph in your next issue, and send any replies on to me, I will treat such with confidence, and can put them in touch with the right party. It is a good chance, especially for a young fellow who wants to get on in the world, because it is with a first-class firm, with decided possibilities of rising to a higher post."

We shall be happy to forward any letters, addressed to "Motor Assistant," c/o THE AUTOMOTOR JOURNAL Office, accordingly.

Arrol-Johnston Cars in India.

Although it was unfortunate that the Automobile Association of Bengal failed to secure sufficient entries to enable them to hold their proposed Reliability Trials, yet it is satisfactory to hear that the Arrol-Johnston car which was sent to Calcutta in order to compete in that event has, before being delivered to its owner, been the means of already bringing a large number of enquiries from would-be motorists in that country. This particular type of car—both the 4-seated and the 6-seated models—is so pre-eminently well suited to the rough roads of India that it is almost safe to predict a large sale out there for the vehicles built by this progressive British firm.

Change of Address.

The British Automobile Development Company, Limited, have removed their head office to King Edward's Mansions, Shaftesbury Avenue (five doors from New Oxford Street).

Sheffield Motor Show.

The Lord Mayor has consented to open this Exhibition at 3 p.m. on Friday, March 2nd. Members of the Motor Union are specially invited to be present, and will be admitted free on production of their membership tickets.

Owing to pressure of business, the Continental Tyre and Rubber Company, Ltd., advise us that they are not showing at the Manchester Motor Exhibition, but that they are holding a special show at their new depôt, 255, Deansgate, Manchester, where a full stock of motor and other tyres, and rubber goods of all descriptions, can be inspected.

Messrs. S. F. Edge, Limited, have determined, owing, they state, to the complaints which are alleged of British manufacturers being unable to meet the demand for British-made cars, to give a guarantee to deliver Napier cars at specified dates, backed by a heavy penalty in case of non-delivery.

Viscount Powerscourt, Controller to the Household of His Excellency the Lord-Lieutenant of Ireland, has just added to his "stable" a 1906 Gladiator car.

At the International Automobile Exhibition in Berlin we learn that no less than 862 wheels were fitted with "Continental" tyres.

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Star Omnibus Motors.

In the directors' report of the Star Omnibus Company, it is stated that the company now have eleven motor 'buses delivered to date, and a further number are expected daily. A number of freehold and leasehold premises have been built with a view to their conversion into motor garages, and the company is therefore in an especially good position for running motor omnibuses on any route that may be considered desirable.

BRITISH EXPORTS AND IMPORTS OF MOTOR CARS, &c., FOR 1906.

Note.—In our issue for January 13th, 1906, we published in one table the full figures of British Exports and Imports for 1902, 1903, 1904, and 1905. Prior to 1902, motor cars were not classified separately.

1906.	Imports.					
	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.
January ...	458	£ 175,270	£ 136,720	114	£ 2,889	£ 1,989

COMPANY DOINGS.

London Road Car Company, Limited, and Motors.

At the half-yearly meeting of the company, on Monday, Mr. John Howard Moore, J.P. (chairman), presiding, the chairman said that there had been considerable reduction in the receipts of the horse-drawn cars. The decrease in the horse-car receipts had been more than made good by the takings of the motor cars, with the result that the total traffic receipts were £204,417, against £200,160 for the corresponding period of 1905, and they had carried 36,275,065 passengers, against 35,687,413, the number of passengers carried by the motors during the half-year being 2,527,174. Under the heading of "Car and Motor Repairs and Renewals," the figures showed a considerable increase, but on the other hand the reduction under the head of "Horse Renewals" was even more considerable. The item of car and motor repairs and renewals had been swollen by their having added thereto the loss which they made on the sale of some motors which were found to be unsuitable for London traffic.

Replying to criticisms in regard to statements which had appeared in the Press calculated to give the impression that the directors of the company, with reference to motor traction, had practically been asleep, and had only recently become alive to a sense of its importance, the chairman epitomised what the directors had actually been doing in this matter for the past six years. He said:—"As far back as September, 1899, the directors first ordered an electric omnibus to carry 26 passengers, which was never delivered. In the following November we actually ran a Thornycroft steam car for over five months with fairly satisfactory results, but the car was withdrawn on the understanding that the manufacturers were to supply others of an improved type, and bodies were built by us in anticipation. The others, however, were not forthcoming. In July, 1901, the directors made a trial of a centre steering tractor, resulting in an order being given, but this order also was never completed. In August of the same year negotiations were entered into with an American company for another electric motor, but the proposal fell through, as did another proposal in the following month for a hydroleum liquid fuel motor. In May, 1902, a contract was made with another American company to deliver three electric motors to carry thirty-two passengers. Delivery was to have been made within three months of the date of the agreement. They did not, however, come to hand until some considerable time afterwards, and consequently the directors of this company intimated that in view of the delay, and of information regarding their working, which was unfavourable, they would be declined. So anxious was the Board to take the lead in introducing mechanical traction that about this time (1902) a tractor was built by the company at their car factory. The design, however, as might perhaps have been expected at this early stage in the evolution of the motor 'bus, was not quite perfect, and, after a good deal of experiment, the tractor idea was abandoned for good. In February, 1903, a contract was entered into for six Daimler motors, and the company built the bodies for these cars. The company was never able to get delivery of these motors, and the bodies have in consequence been used on motors purchased from other makers. I will not weary you with further particulars, suffice it to say the list has by no means been exhausted, and that one and all only brought us disappointment. At length, towards the close of the year 1903 and the beginning of 1904, we made trials with some motors—one propelled by steam and the others by petrol—which really gave us hope of ultimate success. As a consequence of these trials and of the successful running of motors in provincial towns, in December, 1904, the Board came to the conclusion that the experimental stage of motor vehicles had been passed, and consequently placed orders with makers of reliability, stating by circular to the shareholders, dated 2nd January, 1905, that in the opinion of the Board of Directors the time had arrived when the operation of substituting mechanically-driven vehicles for the present horse cars should be seriously commenced, and the existing horses and cars disposed of by degrees.

"You have thus seen that for five or six years the directors have been using every effort to secure a machine which would be quite suitable for the public service. When this was on the eve of fulfilment last year, the promoters of several new motor omnibus companies, who had done nothing to aid the evolution of the motor

1906.	Exports, British and Irish make.								Foreign and Colonial Re-exportation.					
	No. of Cars and Value.		Parts Value.	*B.S. Africa.	No. of Motor Cycles and Value.		Parts Value.	*B.S. Africa.	No. of Cars and Value.		Parts Value.	No. of Cycles and Value.		Parts Value.
January ...	146	£ 48,759	£ 16,334	£ 6,825	84	£ 2,112	£ 2,211	£ 637	68	£ 26,999	£ 9,582	4	£ 205	£ 355

* *Included* in the totals of Cars, Cycles, and Parts.

'bus, appeared on the scene and appealed to the public for funds to enable them to oppose ourselves and other omnibus proprietors, who for all those years had been trying to solve the problem, and the Press, while ignoring our efforts, had nothing but praise for these so-called pioneers. A considerable amount of promotion money must have accrued to these promoters. The ultimate fate of the companies remains to be seen. But the appearance of the newcomers in the field has had the effect of modifying the programme which your directors had mapped out for themselves, namely, to carry out the substitution of mechanical for horse-power gradually. It must be perfectly obvious that the horse drawn car can have no chance against the swifter running motor, and the substitution of the one for the other must therefore be now accelerated and carried through with the utmost possible expedition. The directors are extremely sorry that circumstances have been as described, as in their opinion the evolution of the perfect motor would have been ensured during the period of substitution had it been carried out gradually. The process of substitution will involve a sale of horses far in excess of the number which have ordinarily to be disposed of in each half-year, as well as the putting out of service of the horse cars. The value of horses, cars and harness, which, during the year 1905, have thus been put out of service, is about £30,000, about £20,000 of which have been paid out of revenue, which, under the circumstances, the directors think is very satisfactory, as in addition a reserve account for the depreciation and renewal of motor chassis of £1,000 has been started.

"As regards horse cars for the past ten or eleven years we have built our cars of teak instead of ash. These cars can be enlarged for service as motor bodies of the standard size and type at a comparatively small cost, and we, by adopting this course are able to affect a saving of from £15,000 to £20,000 as between the cost of conversion and that of building entirely new cars. By the second half of the year the greater proportion of the company's stock will have been substituted."

NEW COMPANIES REGISTERED.

General Motor Carrying Company (Limited), 3, York Street, Manchester.—Capital, £50,000 in £1 shares. Object, to carry on the business of general carriers by motor wagon between Manchester and other towns in the Lancashire district. First directors, W. Kay (chairman), W. H. Collier, G. Paton, J. W. Thompson, and J. Miller.

The Glasgow Motor Haulage Company (Limited).—Capital, £20,000 in £1 shares. (Scotch Co.)

Gould Brothers (Limited).—Capital, £2,500 in £1 shares. Object, to acquire the business carried on by E. Gould at 4 and 5, Southernhay, Exeter, as Gould Brothers, of carriage, motor car builders, &c. First directors, E. Gould and G. H. Stephens.

Hartridge Indo-American Tyre Syndicate (Limited), 42, Granville House, Arundel Street, Strand, W.C.—Capital, £3,600 in £1 shares.

International Motor Insurance Company (Limited).—Capital, £100,000 in £1 shares. First directors, J. Broadley, R. M. Bottomley, A. S. Bury, H. Lonsdale, and J. D. Lonsdale.

London and Counties Motor Omnibus Company (Limited).—Capital, £100 in £1 shares.

New Ellis Motor and Cycle Company (Limited), 120, High Street, Watford, Hertfordshire.—Capital, £1,000 in £1 shares. Object, to acquire the business carried on at 120 and 122A, High Street, Watford, as Richard Ellis, of manufacturers and agents for motor omnibuses, &c. First directors, R. Ellis and J. Appleford.

Penrith and District Motor Service (Limited). — Capital, £5,000 in £1 shares. Object, to carry on the business of carriers of passengers and goods. First directors, E. Jackson, J. Altham, J. Thornborrow, H. Jackson, and W. F. Winn.

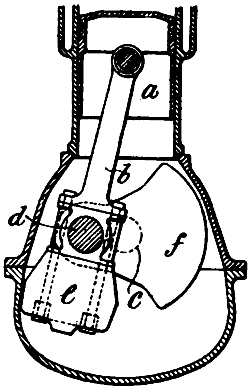
NEW ISSUES.

The Provincial Motor 'Bus and Traction Company (Limited), whose authorised capital is £305,000 in 300,000 ordinary shares of £1 each and 100,000 deferred shares of 1s. each, are issuing the 300,000 shares at par. The primary object of the company is to extend the use of motor 'buses and other forms of motor traction in the English provinces and in Wales, Scotland, and Ireland. The company will be a parent company for the following among other purposes: To establish services of motor 'buses and other motor vehicles in and around various towns in England, Scotland, Wales, and Ireland, under the direct management and control of the company; to form subsidiary companies to run motor 'buses and other motor vehicles under the direction of local boards with representatives of the parent company; to enter into arrangements with municipalities and other local authorities, railway companies, tramway companies, and others for running special services of motor 'buses and other motor vehicles; and to provide express motor deliveries of parcels, goods, &c. Amongst the manufacturers whose chassis it is proposed shall be employed by the company are Messrs. Sir W. G. Armstrong, Whitworth and Co., Ltd., Panhard-Levassor, and Milnes-Daimler. The British Motor Trust, Ltd., are the promoters of the company, for which services they receive £8,000 in cash and the whole of the deferred shares (fully paid).

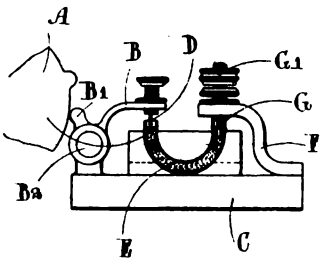
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

11340. 30th May, 1905. Improvements in Balancing the Moving Parts of Engines. Sir W. G. Armstrong, Whitworth and Co., Limited, and Walter G. Wilson, both of Elswick Works, Newcastle-on-Tyne. This invention relates more particularly to explosion engines, but is also applicable to steam and other engines. For the purpose of balancing the moving parts a weight is attached to the connecting rod on the other side of the crank pin to the cylinder. This weight and its distance from the crank pin should be such that the centre of gravity of the piston, the connecting rod and weight, is at the crank pin. There is one drawing, a section of a part of an engine; *a* is the piston, *b* the connecting rod, *c* the crank shaft and *d* the crank pin, *e* is a weight attached to the connecting rod, such that the centre of gravity of the piston, *a*, the connecting rod, *b*, and the weight, *c*, is as near as may be at the centre of the crank pin; *f* is a weight attached to the crank, such that the centre of gravity of the piston, *a*, the connecting rod, *b*, and weights, *e* and *f*, is as near as may be at the centre of the crank shaft.—January 31st, 1906.



1482. 25th January, 1905. Improvements in Electrical Contact Makers and Breakers. Percy W. Noble, Beach House, Dale Street, Leamington. This invention relates to electrical contact makers and breakers, and has for its object to provide a simple low-tension contact maker and breaker suitable for the electric ignition of internal combustion engines. In this invention a tube containing mercury and a conductor are in the path of the primary corcuit, and the conductor is adapted to be dipped mechanically into the mercury and withdrawn, to cause the closing and opening of the primary circuit. The mercury is contained in U tube, and the conductor dipped into one branch, whilst in the other branch an adjustable plug is inserted, so that adjustment of the level of the mercury can be obtained as required. There is one drawing—an elevation. The ignition cam is mounted on the half-speed or other shaft and co-operates with the end, B^1, of a rocker, B, pivoted at B^2, to a suitable insulated base-plate, C. This rocker, B, carries at its end an adjustable conductor, D, which is arranged to dip on movement of the rocker, B, into a U-tube, E. The U-tube is carried in any convenient manner, as by the base-plate, C, or an insulated arm, F, and is filled to a convenient height with mercury. Into the other end of the U-tube dips a second conductor, G, adjustable as shown To this conductor, or to a terminal, G^1, thereon, is led a primary wire in the usual manner. In operation, when the cam, A, engages the rocker, B B^1, the conductor, D, will be dipped into the mercury, and the current, led thereto by the wire to the terminal, G^1, will be earthed.—January 31st, 1906.



Patent Specifications Published.

Applied for in 1905.

Published February 22nd, 1906.

1,857. G. Pilkington and F. W. Barnes. Variable speed belt gearing for tri-cars.
2,103. F. C. Ihlee. Intl. combn. engines.
2,648. Wolseley Motor Car Co., H. Austin, and L. Silverman. Ball bearings.
3,278. S. Schick. Driving gear.
3,534. F. P. Candy. Driving belts for motor cycles.
4,184. C. H. Stotesbury and T. P. Reid. Pneumatic tyres.
5,881. National Gas Engine Co., Ltd., and P. W. Robson. Intl. combn. engines.
6,252. A. G. Greenway. Supporting bodies on their frames to lessen vibration.
6,661. J. C. and L. J. Smit. Starting gear.
7,444. J. W. Greenwood. Electric tail lamps.
9,376. T. F. Robinson. Method of igniting explosive charge.
9,466. L. Reynolds. Two-stroke intl. combn. engines.
9,874. W. Chapman. Wheels for agricultural motors.
10,082. J. C. Hudson. Self-propelled fire engines.
10,388. W. G. Windham. Motor vehicles.
12,767. D. McCan. Disc wheels.
14,323. S. and A. R. Bullock. Ignition device.
17,385. E. Dombret. Valve operating regulating gear.

The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

No 269. (No. 9, Vol. XI.)] MARCH 3RD, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.

"A TRY FOR THE HERKOMER TROPHY," was the title of an interesting paper read by Mrs. Edward Manville before the members of the Ladies' Automobile Club of Great Britain and Ireland last week. This chatty résumé of Mrs. Manville's participation in the various trials for the famous Herkomer Trophy we reproduce in this week's issue of "The Automotor Journal," together with a number of the charming photographic views with which Mrs. Manville's paper was illustrated. The above are some of those referred to in her paper, three of them representing scenes at different frontiers which were passed by Mrs. Manville and her party. The top left picture is unique, as it shows the car half in Switzerland and half in Germany. The picturesque photograph at the bottom on the right, is at Ettal, where a visit was paid to the very quaint old monastery.

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

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British Events.

March	... *4,000 Miles Tyre Trials.
March	... *Lamp Trials.
March	... *Speedometer Trials.
March 8	... A.C.G.B.I. General Meeting.
March 2–10	.. †Sheffield Motor Show.
March 9–17	... †Glasgow Motor Car Show.
March 17	... Ladies' A.C. Meet at Montreal, Sevenoaks.
March 24–31	Cordingley and Co.'s Motor Show.
May 26	... Motor Union Meeting (Birmingham).
June 11–16	... Lands End to John O'Groat's (Auto Cycle Club).
June 13–16	... Scottish Reliability Trial.
June 30	... Ranelagh Automobile Gymkhana (Ladies' A.C.).
July 21	... Motor Union Meeting (Bath).
Aug.	... *Van Trials.
Sept. 22	... Motor Union Meeting (York).
Sept. 27	... *Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
April 1–17 ...	Budapest Exhibition (A.C. of Hungary).
April–May ...	Milan Exhibition.
April ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 13–14 ...	Tour de France (Motor Cycles and Voiturettes).
June 6–13 ...	Herkomer Cup.
June 28–29 ...	Kiel Motor Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
July 26–Aug. 15	Circuit Européen.
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15–16 ...	Mont Ventoux Hill-Climb.
Sept. 20 ...	Lake Major Motor Boat Races.
Oct. 5–14 ...	Leipzig Exhibition.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

The Occultation of Headlights.

For many months—we might almost say years—everybody has been hammering away at the unnecessary and disconcerting glare which the headlights of so many motor cars diffuse before them. There has been a great deal of feeling on the subject. Ladies on bicycles, when fixed by the brilliant gleaming eye approaching them rapidly out of the dark, become confused and embarrassed, and convey their confusion and embarrassment to their iron steeds, which wobble in consequence from one side of the road to the other, to the imminent danger of the lady riders, and the unspeakable terror of the driver of the car; horses stand upon their hind legs or jib with terror in the middle of the road, devoutly believing that "the last day" which they have been told about in their youth, has come at length, and even ordinary pedestrians hold on by the twigs of the nearest hedge, so as to be sure of getting out of the way of the approaching danger as completely as possible. To look at the matter seriously, there is no doubt that an excessive glare on the front of a car, particularly in more or less effectively-lighted towns, is at times an annoyance and even a danger to other users of the road, and we have always deprecated the employment of headlights that produce it. We are accordingly glad to see that there is a probability of combined action on the part of the Automobile Club and the Motor Union. Trials and tests of headlights are now being conducted by the club, and the Motor Union has pointed out that this would be a good occasion "to encourage manufacturers to design and make a lamp which, while meeting the requirements of automobilists, should not give any ground for reasonable complaint from other members of the travelling public." It would seem, in fact, that what is really needed is a variable headlight. In shadowy country roads, where vehicles are few and far between and where such carts as are met with have no lights behind them, and above all, where turnings are frequent and sudden, a powerful headlight is a practical necessity for the automobilist, however slowly he may be travelling. Where he comes into lighted districts, however, the light that is justifiable and even needful in the country, becomes a public nuisance, and there he ought to be able to veil or diminish its splendours to the necessary extent. It must not be forgotten, however, that one of the principal reasons of the introduction of the powerful headlight on a car has been the absence of tail-lights on ordinary horse-drawn vehicles. The proposal to moderate the power of headlights, therefore, should have some connection with a guarantee that legislation to render the use of tail-lights universally compulsory should be introduced at an early date.

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Methods of Overcoming the Difficulty.

There are several ways in which the variable headlight—the headlight that can be made bright when required, and only moderately brilliant where excessive brightness would be a nuisance—can be designed. One method, which we illustrated in the Journal, consists of employing curtains in front of the burner. This seems rather a wasteful method, as it means employing a powerful source of light, and then damping it down without any corresponding economy in cost. Another method which has been proposed, and is, we believe, the subject of patent applications in this country, is to employ gas of moderate illuminating power for lighting the headlights and automatically enriching it to a greater or less extent with acetylene when required. This is easily done by having a certain amount of calcium carbide arranged in a receptacle inside the gas connections, when a few drops of water, allowed to fall upon the calcium carbide, will instantly disengage a copious supply of acetylene, which will treble or quadruple the illuminating power of the gas flames employed. Electricity, too, has its merits. The more general introduction of combined lighting and ignition plants, in which a small battery, which can work the ignition coil and furnish current to incandescent lamps, has its place on the car, provides, perhaps, the best and most satisfactory solution. A group of small incandescent lamps can be arranged inside the headlight, one only of which, say, is switched on where a small light is needed, the whole bunch being illuminated when high power is required. Electric lighting, too, has the great advantage of enabling the driver of a car to be absolutely certain that his rear light is burning, as he can have a small light or other indicator in series with it on the dashboard. If this dashboard-lamp is burning, he may be quite certain that his rear lamp is also illuminated, an assurance with which he is not provided by any ordinary system of car lighting.

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Lady Elizabeth and the Juggernaut—A Tale of a Tragedy.

Of course, no one would suspect the Highways Protection League of being capable of writing a novel, but if appearances and "language" count for anything, they have been aiding and abetting Miss Evelyn Everett Green to do it for them, and she has risen to the occasion. Doubtless, she has been supplied gratis by the League with all the remarks which its members, associates, and friends have made about the automobile for some years past, and the result is that Miss Everett Green raises a complicated shriek in fifteen flats and thirty-seven sharps that would do credit to Miss Corelli when disputing with any who do not adopt her special brand of Christianity, or suggest that Shakespeare did not write all the plays that go by his name. Miss Green's characters are divided into "demons on wheels" and anti-automobilists of the regular time-honoured, thickly-crusted, and stereotyped variety. To the latter category belongs Lady Elizabeth. She will not allow a motor car inside her park gates, and she is backed up by a Miss Flemyng, an elderly spinster, who talks yards and yards of the most egregious twaddle about her poor garden, and how her flowers, which she had brought up on the bottle or fed out of her hand, or something of that kind, are gradually succumbing to the dust. The automobilists, on the other hand, are a "parcel of empty-headed idiots with long purses and no brains who go flying through the country in an absolutely selfish and senseless fashion seeking nothing, hearing nothing but their own hooters and screeching engines," and leaving behind them one continuous pulp of children, dogs, and other four-footed creatures. Two such maniacs are Lady Betty and her brother, Lord Rendover. But ultimately, like all wicked people in good novels, they get converted. Lady Betty is converted by an attempted abduction, after which she always goes on foot (though why she should be any more difficult to abduct when footing it, is not apparent), and Lord Rendover is converted by an accident, in which he seriously injures a little girl.

Finally, before finishing the perusal of the work, we were delighted with the truth of our own perspicacity displayed in the first lines of what we have said above, for there fluttered from the pages of the egregious publication a printed slip which sets forth the interesting information that anybody can become a member of the Highways Protection League who is willing to pay five shillings per annum for the privilege. "*Das also war des Pudels Kern!*"

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The Road Club.

That the automobile would be sure, sooner or later, to restore something of the old-fashioned charm of English roads is a point on which we have always felt certain. It is, accordingly, with satisfaction that we hail the formation of the Road Club, the principal object of which is to bring the automobile traffic of the present day to the assistance of the almost extinct and moribund inns with which the surface of the British Islands is strewn. Many a charming old hostelry of this kind—we could name plenty of them—has got into difficulties, and even gone under altogether in the struggle for existence, just before the advent of the motor car was destined to place others on a fine commercial basis once again. It was the old inn parlour, with its scoured bricks and fireplace brassware, that provided the sort of atmosphere in which Thackeray, Goldsmith, Sir Joshua Reynolds and Sir Richard Steele delighted. Let us trust that the Road Club will save them from extinction, for the literature of past centuries owes them a considerable debt. At any rate, the Road Club is making a good try to effect this object. Its membership, which includes such names as the Duke of Sutherland, Lord Montagu, Earl Fitzwilliam, Earl Roberts, Lord Suffield, Lord Northcliffe, the Hon. Arthur Stanley, &c., is arranging for a number of old-fashioned inns to become headquarters of the club. The numbers of automobilists who really use the automobile for travel, just as a century ago people used the stage coach for the same purpose, or the private chaise, is becoming more and more numerous, and if, under the auspices of the Road Club, our picturesque old inns polish themselves up inside and become up to date as regards comfort and cuisine, there is no reason why the Road Club should not be successful in rescuing from destruction, just in time, one of the most picturesque elements of old English life, and one for which this country was in past centuries so justly and so widely famous.

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Building on Misconceptions—Steam and Electric.

One of the pieces of sound advice which the wise man gave his son on going out into the world was that "you should never take grievance-mongers too seriously." There have been some grievance-mongers who have complained that the steam car (of course a particular steam car) has not had fair treatment generally, and quite a long time ago—they have either changed their views since or become extinct—there were people who thought, or at any rate maintained, that the electromobile had not had a fair show in the columns of the automobile Press. Few people have, we should imagine, ever taken these exploiters of imaginary grievances very seriously. It will therefore be a cause of no small amusement to them to find that the alleged misfortunes and persecutions of the steam car and the electromobile are furnishing a pretext for starting a new motor paper, to be specially devoted to the interests of these oppressed and persecuted branches of the industry. We greatly fear that its life will be a short one, and unlike the short life of Achilles, not compensated for by very permanent celebrity. The fact of the matter is, that the whole idea is based on a misconception. It is simply ludicrous to maintain for a moment that either the steam car or the electromobile have not had a fair show and a fair hearing in the automobile Press. In THE AUTOMOTOR JOURNAL alone, some scores of pages in the last few years have been devoted to the various types of steam car, and if the great law of the survival of the fittest seems to have definitely pronounced in favour of one particular type of steam vehicle, that is certainly compensated for by the extreme popularity which that vehicle itself has attained. Certainly neither in this country nor elsewhere do its representatives feel themselves aggrieved persons.

As regards the electromobile, there was a time when there seemed a probability that it would hold its own as a touring vehicle. Since then it has proved itself to be pre-eminently the vehicle for town use, and pre-eminently *not* the vehicle for any other purpose. But in the days when the electromobile was struggling to show what it could do, we certainly (and we were not alone) did all that possibly could be done to keep the public well informed concerning its constructional details and its merits. That it has not succeeded in a wider sphere than that for which it seems to have been marked out by nature, is only one of the many cases of specialisation of function which we see in the mechanical not less than the organic world.

It simply will not do to attempt to found a newspaper on imaginary abuses or imaginary grievances. The mere fact that in doing so, two such totally unhomogenous interests as those of steam and electric cars have to be amalgamated, is quite sufficient to show the untenability of the position.

The Automobile Association becomes Exclusive.

WE all know the good work that the Automobile Association has done in the past, what a weight of trouble it has taken off the over-burdened shoulders of borough and county magistrates, who have been able to go home to lunch, or at any rate to dinner, at hours which, but for the benign interference of the Association, would have for ever have remained impossible. The police, too, have been spared an immense amount of time and undignified self-effacement in the umbrageous thickets and pigstyes of the Ripley Road and other places. These classes, no doubt, recognise the good work that has been done by the Association in discouraging and repressing driving at excessive speeds. Hitherto the Association has worked for the benefit of the cause, making no exceptions to persons. From now on, the advantage of being restrained from breaches of the law by means of its scouts is to be confined to its members, and they will be provided with a secret sign or symbol of some kind affixed to their cars, which the Association's scouts will then recognise, and it is only cars which are thus distinguished which the scouts will warn, either that they appear to be proceeding beyond the legal limit, or that there are "rocks ahead." We think, however, that as the Association has always maintained that its *raison d'etre* is to prevent breaches of the law by motorists, they should at least warn *everyone* driving at a speed apparently excessive. Other information may, of course, quite properly be reserved for members.

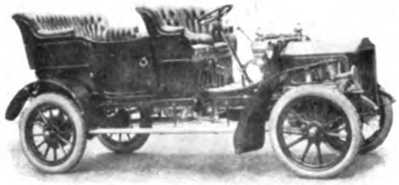
How to Recognise the Cars of To-day.

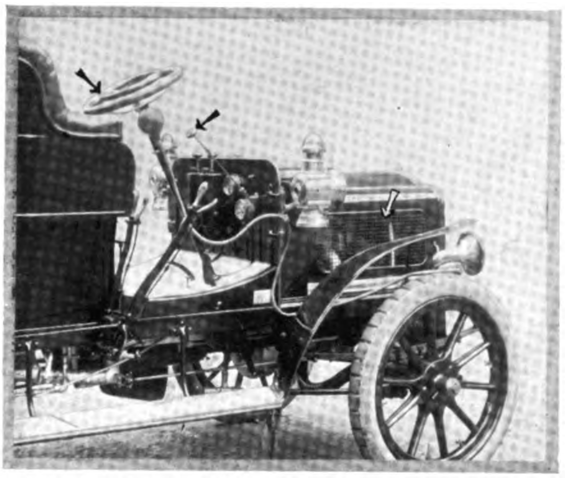
(No. 7).

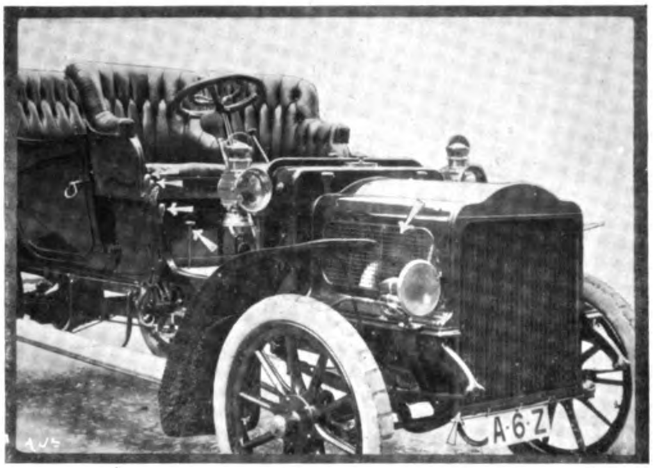
The White (Steam).

(AMERICAN)

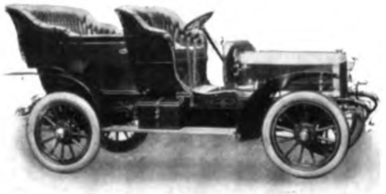
15 H.P. & 18 H.P.







The 18 h.p. model—manufactured in America—is of the live axle type. Not easily distinguishable from an extremely quiet petrol vehicle, it has nevertheless many characteristic features. The RADIATOR projects below the frame, there are WIRE GAUZE PANELS IN THE BONNET, the THROTLE WHEEL is prominent above the steering wheel, the fittings on the dash are distinctive, and there are three hand levers at the side. None of the earlier (15 h.p.) cars have side entrances. (See "AUTOMOTOR," Vol. X., 30th Sept., 1904).

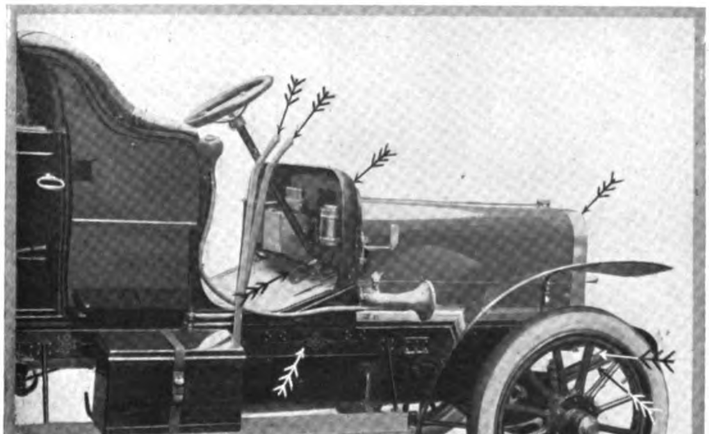


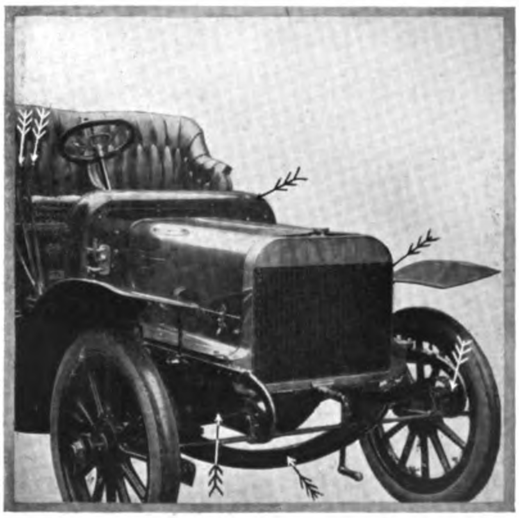
(No. 8).

The Winton.

(AMERICAN)

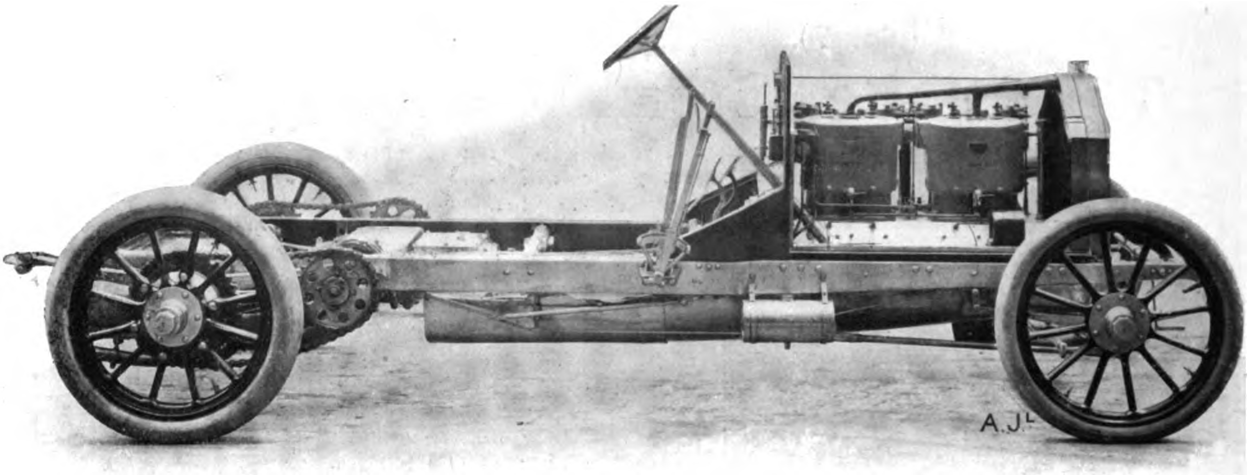
16 & 25 H.P. (Vertical).





All Winton cars can be identified by the TWO SIDE LEVERS, and by the ORNAMENTATION of the main frame. Both the present models have distinctive RADIATORS, BONNETS, AND DASHBOARDS, while equally unusual are the DOUBLE SPRINGS (back and front) and the large manganese-bronze FRONT AXLE.

THE 60-H.P. DE DIETRICH CAR.

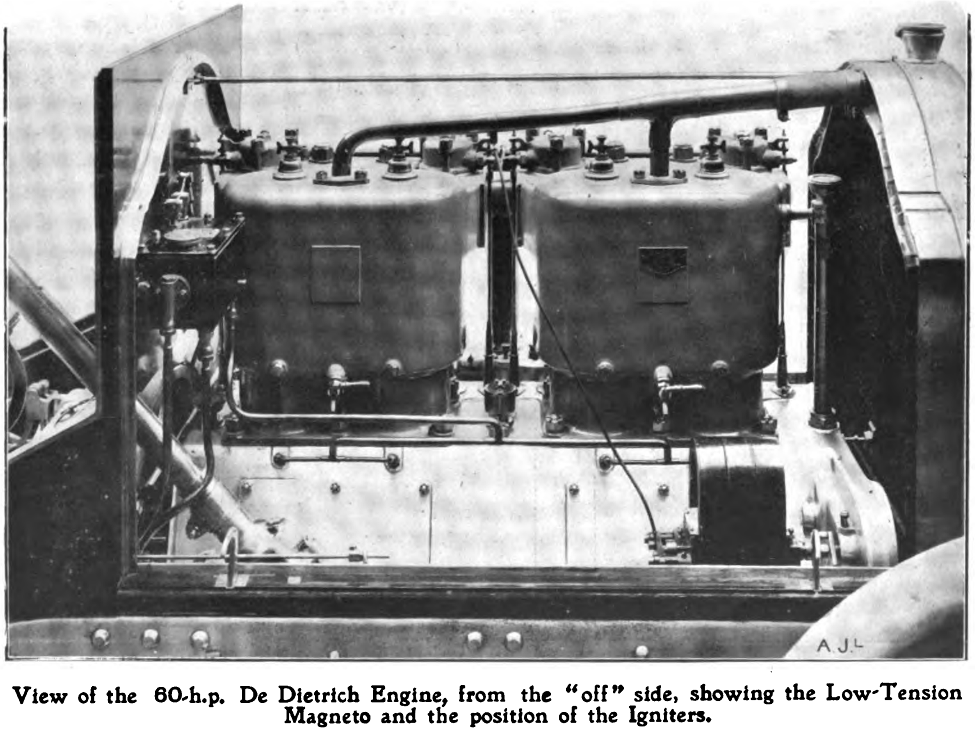


Side view of the 60-h.p. De Dietrich Chassis.

ALL the leading characteristics of this carefully-designed and well-built De Dietrich vehicle are similar to those of the less powerful (12–15-h.p.) model that we described with a number of illustrations, at the time of the last Olympia Show (*see* THE AUTOMOTOR JOURNAL of November 25th and December 2nd). It is, in fact, a large edition of the same car, as will be recognised by comparing our present illustrations of the engine and of the chassis with Fig. 3 and Fig. 5 respectively of our former article.

Much more room is naturally occupied by the engine, for the cylinders have a bore of 150 mm. and a stroke of 175 mm., while one of the very few respects in which this 60-h.p. vehicle differs radically from the neat little 12–15-h.p. car, is also to be found in connection with the engine. We refer to the substitution of a low-tension magneto system for the high-tension magneto on the smaller model, and we would draw particular attention, in our present photograph of the large engine, to the manner in which the make-and-break igniters are fitted above the cylinder-heads in such a manner that they can be easily and bodily removed, and can also be operated from the same cam-shaft as the valves. We need hardly say, moreover, that Messrs. Jarrott and Letts also fit their special "C.J.L." supplementary battery apparatus as a stand-by—as also for facilitating starting — on any of these cars, if desired.

The particular vehicle from which our photographs were taken is the first of this type to make its appearance over here, and we understand that it has already been sold to Mr. R. Douglas Croall, of Edinburgh. Amongst the unusual features of the present De Dietrich models, it will be remembered that universal-joints are introduced into each end of the differential countershaft, and that an ingenious spring-cushion device—forming a part of the operating mechanism—enables the hub-brakes to be applied progressively instead of with any degree of suddenness.



View of the 60-h.p. De Dietrich Engine, from the "off" side, showing the Low-Tension Magneto and the position of the Igniters.

PERMANENT TYRE REPAIR, ON THE ROAD.

Nothing that tends to reduce the cost of tyres, and the annoyance of repeated tyre-troubles, can fail to appeal with special force to every motorist, and we are therefore convinced that not a few of our readers will take a very strong interest in the descriptive article that we are now able to give concerning the construction and manipulation of the latest portable vulcanizer which has been put on the market by Messrs. Harvey Frost and Co. This type of vulcanizer is not, however, altogether a novelty to them, for we published a somewhat similar article in our issues of September 23rd, September 30th, and October 7th last, in which we dealt in equal detail with what was at that time the latest "H.-F." apparatus. It is not therefore necessary for us to begin at the very beginning on the present occasion, to set forth the general principles of vulcanizing, or to explain the vast difference that there is between a vulcanized repair and an ordinary roadside makeshift, but our chief object now is to bring before their notice a smaller, lighter and altogether more highly developed form of vulcanizer that not only enables inner tubes to be repaired when punctured, but is also equally applicable for making good any damaged outer covers. Incidentally, nevertheless, attention should be directed,

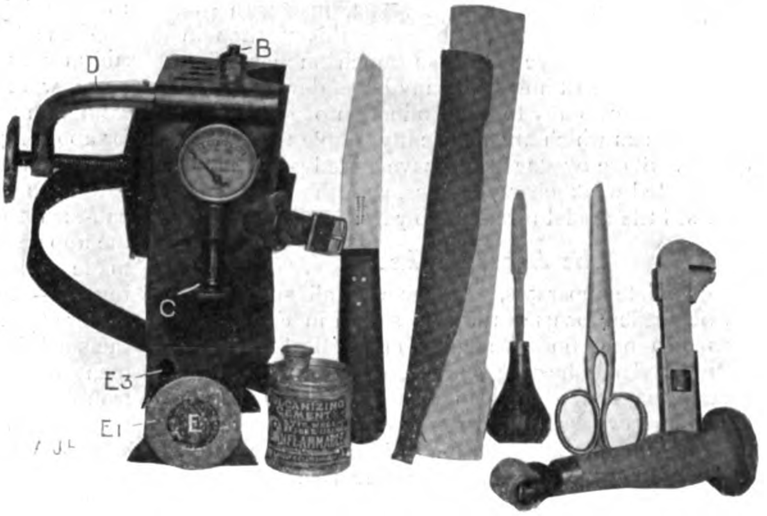
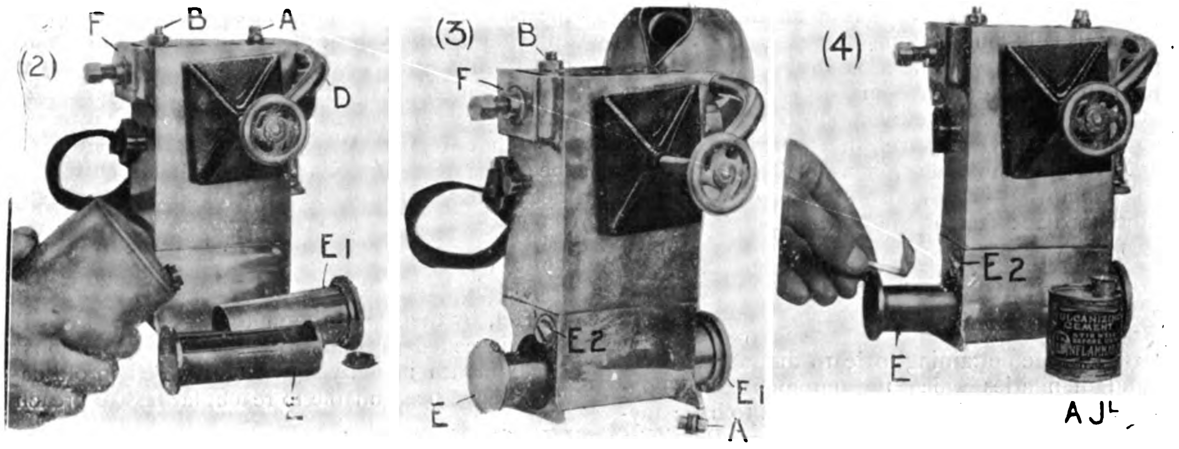
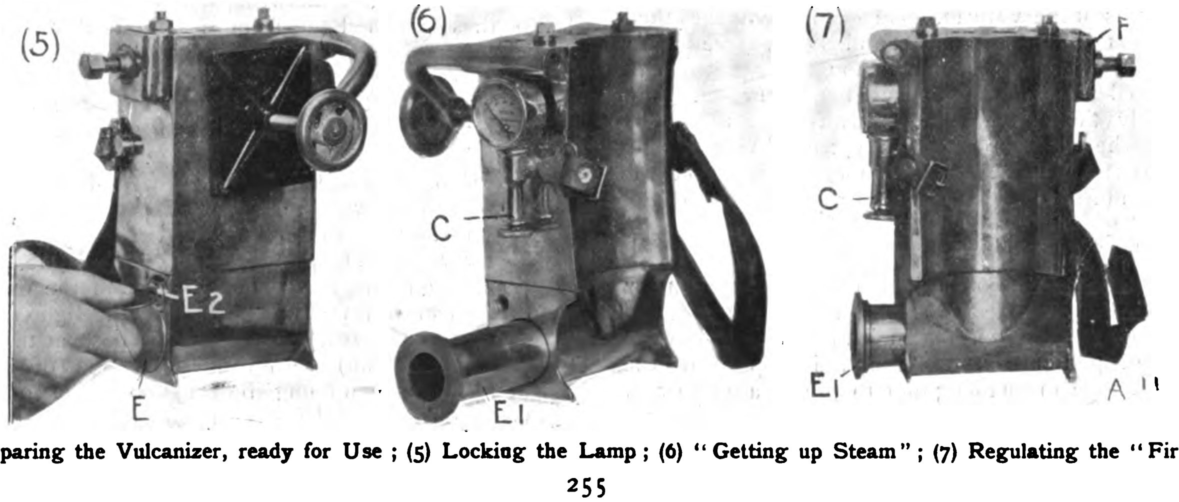


Fig. 1.—The "H.-F." Portable Vulcanizer for Motorists. View of the complete apparatus, together with a few tools that are useful when making Tyre Repairs with it.



(2) Filling the Lamp, E; (3) Filling the Boiler; (4) Lighting Up.



Preparing the Vulcanizer, ready for Use; (5) Locking the Lamp; (6) "Getting up Steam"; (7) Regulating the "Fire."

before passing on from generalities, to the vast importance, in practice, of effecting an immediate repair as soon as possible after a tyre has been injured, for not only does a small cut rapidly develop into a serious wound, but there is a strong tendency for rot to set in, inside the fabric of the tyre, and for the whole cover to be rendered useless. It is, in fact, just with the object of enabling motorists to make this "stitch in time"—which can save them so much money—that Messrs. Harvey Frost and Company have devoted their attention so successfully to the production of small portable vulcanizers which are sufficiently simple to be used by anyone. Stage by stage, they have added good points and eliminated weak characteristics, with the result that their latest little model is remarkably handy and efficient.

The Apparatus Itself.

The complete apparatus, together with all such tools as can be needed for use with it, is shown in Fig. 1. It consists of a neat boiler, having four vertical fire-tubes for giving a large heating surface, and a compact little spirit lamp that slides into place beneath. At the top of the boiler are two small fittings, fixed by screw-threads, these being the filler-plug, A, for introducing the water, and the safety-valve, B. On one side is a combined steam-gauge, air-vent, and blow-off cock, C, the cock serving the triple purpose of allowing the air to escape when filling the boiler, of indicating when sufficient water has been poured in, and of being used as a "try-cock" to ascertain whether there is still water in the boiler or not after the apparatus has at any time been in use for an unusually long period.

In Figs. 2 to 7, the vulcanizer is shown from several different points of view, in some of which it will be noticed that its front face is curved out to fit around the outside of an ordinary tyre cover, that straps are secured to it for holding it in place on a road-wheel, that a detachable clamp, D—which also serves as a handle—enables the flat back face of the vulcanizer to be used for the repair of inner tubes, and that there is a socket, F, formed on the opposite side to the pressure-gauge fitting; this socket, F, enables the vulcanizer to be attached to the rear lamp-bracket of a car, so that it can conveniently be used in that position for making small repairs or can be fixed there temporarily while "getting up steam."

Of the lamp, E, itself comparatively little need be said in view of its simplicity, for it merely consists of a gauze wick enclosed in a partly cut-away cylindrical casing, and can hold sufficient methylated spirit to burn for about 45 mins. without refilling. It can be slid into place beneath the boiler from the side opposite to the steam-gauge, and is then locked in place by giving a half-turn to the screw, E^2, while, from the other side of the apparatus, the regulating shield, E^1—which can be made to more or less extinguish the flame from the burner—can be pushed in or drawn out as may be required. For lighting up the burner, when in place, the small hole, E^3, is provided. By the special arrangement adopted, the vulcanizer can be used without trouble in the open air, even though there may be a strong wind blowing, for the lamp is well protected from adverse air currents, and the vertical tubes ensure an effective up-draught.

Quite a small amount of space is occupied by this very compact little vulcanizer, which fits into a neat leather case that can quite easily be stowed away on a motor car, and weighs no more than about 7¾ lbs. For use with it, the only essentials are a tin of the specially prepared vulcanizing solution, a brush for applying it, and a sheet of rubber compound from which the freshly built up portions of a damaged tyre are manufactured, by means of the heat and pressure of the vulcanizer. Our first illustration shows, however, some tools that are particularly useful in the manipulation of the apparatus—a sharp knife, a small curved rasp, a metal roller, a pair of scissors, and an adjustable spanner.

(*To be continued.*)

* * * *

The Pope Not a Convert.

It is rather entertaining to learn that amid all the Courts and dignitaries which the automobile has conquered, there is one which steadily refuses to have anything to do with it—the Court of the Supreme Pontiff at the Vatican. The present Pope is anti-automobile in the fullest sense of the word, and absolutely refuses to admit a motor car of any kind or description within the sacred walls of the Vatican. He even discourages their use amongst the sacred college, and, so far, there is only one cardinal who has been rash enough to set at nought the Papal interdict. Considering, however, how thoroughly the automobile is justifying its use by enabling the clergy to carry out extended visitations in other parts of Italy, one cannot imagine that the opposition of the Vatican will be permanent.

Another Episcopal Car.

We have referred on several occasions to the use to which the automobile is being put by a number of Bishops of the Church of England. The Bishop of Worcester, particularly, has found its speed of the greatest service in enabling him to preach a number of sermons to a number of different people far in excess of anything which he could have accomplished otherwise. In fact, by the use of the motor car the vigorous Bishop has succeeded in delivering some fifty sermons in a single month in outlying villages which in old days he would have been unable to reach, far less to preach in.

Who is the Lunatic?

There are weird occurrences taking place at Grove Hill—and the local police force seem inclined to maintain that "there be wisions about." One of the last of these assumed the form of a dummy policeman suspended, as if he had been duly lynched, from the arm of the danger signal which the Middlesex County Council has affixed at the top of the hill. It transpires that this "portent" was substantial enough, and not a mere materialisation of psychic phenomena, for the figure, instead of being stuffed with cold pie and stout, was filled up with straw. Previous to this, a police constable on duty at the spot had been mysteriously called away by the sound of a police whistle, after returning from which excursion he found the danger sign broken and smeared with tar. Why the sign cannot (subserving as it does a most useful purpose at the top of a dangerous hill) be let alone is one of those phenomena which nothing but a knowledge of the habits and customs of the local lunatics would enable us to explain.

MEASURING POWER AT THE ROAD WHEELS.

IT is strange, in view of the universal demand of motorists to know what actual power they have available on the road wheels of their cars, that there are not already accessible one or more public, or at least semi-public, testing machines installed for this purpose in Great Britain. One frequently hears owners of cars asking how they can ascertain accurate data concerning the actual horse-power that is available for climbing hills, and yet they still have for the most part to content themselves with such information as they can get concerning the power which the engine proved itself capable of developing before it was fitted to the chassis. This is, of course, not what they really want to know, for it gives no clue to the efficiency of the transmission gear, and to the free running of the various parts between the engine and the road wheels. Further than this, it would be an enormous convenience to motorists if they could now and again have the power of their cars tested, to see whether they are pulling as well as they should, and it has long been recognised that there is no reason why suitable machines should not be installed in a few of the larger towns throughout the country, to enable this much-needed information to be obtained by anyone. One of the chief merits of such tests of complete vehicles, is that they could be carried out in a comparatively short time, and would not involve taking the car to pieces in any way. Testing plants of a similar character have for some time been in use in the large locomotive shops, and similar works where traction-engines are built, but we only know of one or two automobile builders who have such an apparatus available, even for their own use, and these are intended more for testing heavy commercial vehicles.

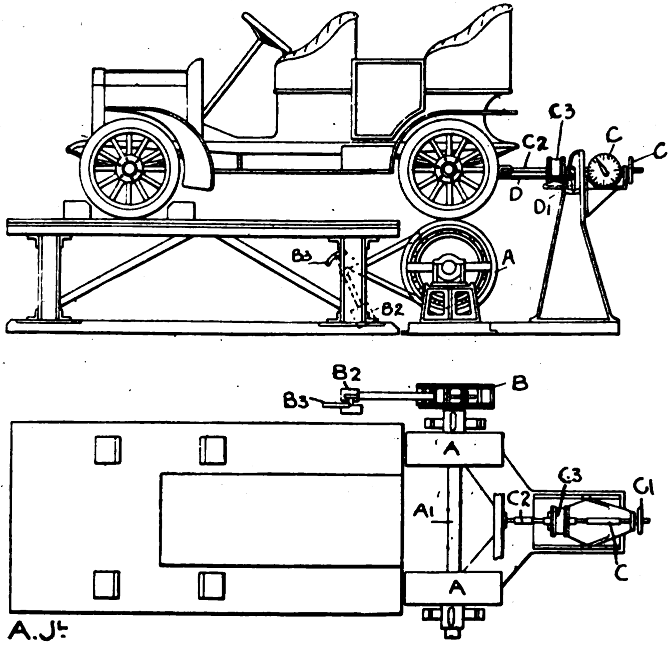


Fig. 1.—Side elevation and plan of the Testing Plant for Automobiles at the Purdue University, Lafayette, U.S.A. In the upper illustration a car is shown in place, ready to have the h.p. on the road-wheels measured.

An U.S.A. University Forestalls the A.C.G.B.I.

It is, we believe, pretty generally known to our readers that the Automobile Club have for some time had such a machine in hand for testing all ordinary types of pleasure vehicle, and now and again official references have been made to it which lead to the hope that sooner or later it will mature in a concrete form. Meanwhile, however, more speedy progress has been made in this direction in America, and such a testing plant is now installed in the Purdue University at Lafayette, Indiana, U.S.A. This machine is constructed on similar lines to those used in locomotive works, and is, we believe, more or less identical with that which the A.C.G.B.I. have in hand over here. The following particulars, which we are now able to give with a few general illustrations, will therefore doubtless prove interesting to a large number of our readers. As will be recognised, there is no real difficulty in constructing a machine of this kind, while, further than this, it is quite a straightforward job to operate it properly and to obtain reliable readings showing the actual power of the car.

A Few Elementary Facts Concerning H.P.

By way of brief preliminary explanation for those who are insufficiently acquainted with mechanics to understand what the term "horse-power" really implies, it may be a convenience if we give a few words by way of explanation.

"Horse-power" is a convenient unit indicating a definite *rate* at which work is being done, and is usually expressed as being equivalent to 33,000 foot-pounds per minute. As applied to a car, therefore, if we know what is the pull (in pounds) that is exerted by the driving tyres on the road surface, as also the speed (in feet per minute) at which the car is travelling, we can then calculate the foot-pounds per minute by simply multiplying these two figures together, and can consequently then ascertain the horse-power by dividing that result by 33,000. It might also serve to elucidate the matters that are to follow in the minds of non-technical motorists, if we were to draw their attention at the same time to the fact that in the testing apparatus we are about to describe, the same conditions are obtained as if the car were propelling itself along a road, although, as a matter of fact, the car itself happens to be held stationary and it is the "road"—an "endless road"—that is propelled backwards by the car instead.

General Construction and Action.

In Fig. 1 the complete apparatus is shown diagrammatically from the side and from above, a car being shown in place in the former illustration. Here it will be observed that the car has been hauled up upon an elevated platform, and has been drawn rearwardly, so that its driving-wheels rest upon two large pulleys, A, which are mounted upon a substantial shaft, A^1. These pulleys and their shaft are free to revolve in large bearings fixed to the floor, and it is the pulleys, A, that represent the revolving and endless road surface. If, when in this position, the car is driven in the usual way, the effect would be for it to run forward, *or* for the rear wheels to drive the pulleys, A, round backwards. The car is, however, prevented from going forwards by means

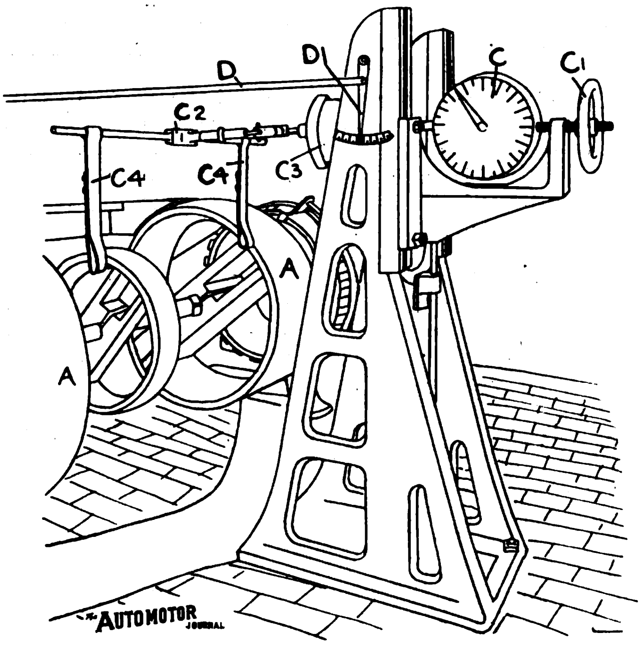


Fig. 2.—The indicating portion of the Purdue University Testing Plant, showing the spring-balance dynamometer, C, with its adjustment-wheel, C^1, draw-bar, C^2, dash-pot, C^3, and attachment-straps, C^4. Also visible are the large pulleys, A, which act as the "endless road" that is propelled by the car.

of a flexible bar, C^2, which ties it to a portion of the apparatus that is rigidly fixed to the floor, but between the bar, C^2, and the solid framework through which it passes is introduced a spring balance, C, that indicates the precise pull upon the bar. The car, when driven, can thus only drive the pulleys, A, and cannot itself move, while the force with which it tends to go forward is at all times indicated by the spring-balance.

As long as the pulleys, A, are quite free to revolve, only comparatively little power will be required of the engine, but it will be noticed that a large brake-drum, B, is also fixed to the shaft, A^1, and that this is surrounded by a powerful brake that can be tightened up to the required extent by means of a hand-screw, B^1.

The more the brake is tightened, the more power will the engine be called upon to give, and simultaneously the higher will be the reading upon the spring-balance, C. Thus, all the necessary data is rendered available for ascertaining the actual horse-power exerted by the car as a whole, for it is only necessary to note the speed of the pulleys, A, and the draw-bar-pull, as shown by the spring-balance, C, in order to arrive at the rate at which work is being done—the foot pounds per minute. Assuming, for instance, that the spring-balance were to read 300 lbs., and that the peripheral speed of the pulleys, A, was 1,760 ft. per minute (20 miles per hour) —*i.e.* 220 revs. per mim., with pulleys 8 ft. in circumference—then by multiplying these together we should have 528,000 foot lbs. per minute, and by dividing by 33,000 we should arrive at the actual horse-power—16 b.h.p. It will readily be understood that tightening the brake-band about the drum, B, is equivalent to increasing the steepness of a hill when the car is running in the ordinary way on the road, and that since any required degree of tightness can be obtained, so that the maximum horse-power can be measured on each of the "speeds" provided by the gear-box, and at any required engine-speeds.

Some Constructional Details.

Considering now the testing apparatus itself in somewhat greater detail, it will be noticed that straps, C^4, are fitted to a cross-member of the flexible bar, C^2, for the purpose of attachment to the back-axle, or the framework of the vehicle, while further provision is made by which the rear-wheels of the car can be kept immediately above the centre of the pulleys, A, by means of the hand-wheel, C^1, just behind the spring-balance, C. There is, too, a small indicating pointer, D^1, conveniently placed for the observation of the operator, this pointer being controlled by a rigid rod, D, that is also attached at its forward end to the vehicle. By tightening or slackening the wheel, C^1, he is always enabled to keep the car in the desired position, *i.e.*, to keep the pointer, D^1, in the centre of its graduated quadrant. These portions of the mechanism are best shown in Fig. 2, where two other small constructional details are also rendered evident. We refer to the arrangements that are made for bodily raising or lowering the spring-balance, C, with its attachment-rod, C^2, and hand-wheel, C^1, to suit the particular vehicle which is being tested, and to the dash-pot arrangement, C^3, which is introduced between the spring-balance and its draw-bar, in order to absorb all vibrations and give a steady reading on the dial, C.

The brake on the shaft, A^1, is prominent in Fig. 4, where it will be seen that the brake-drum, B, is so shaped internally that it can be kept cool by a constant

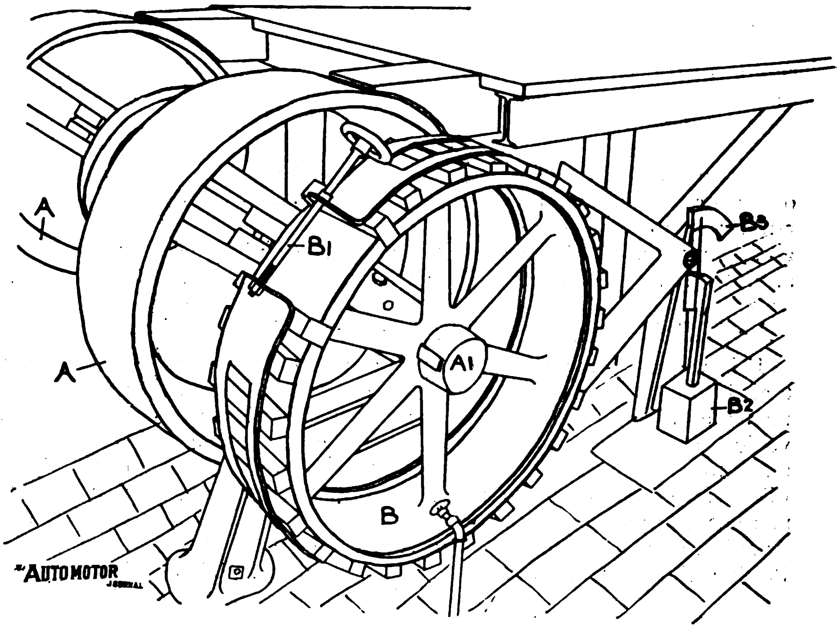


Fig. 3.—View of the adjustable brake of the Purdue University Testing Plant; the water-cooled brake-drum, B, is fixed to the same shaft (A^1) as the large pulleys, A, upon which the driving wheels of the car are supported.

stream of water, and that the adjustable brake-band is furnished with a device for showing the pull upon it, so that a direct reading of the b.h.p. on the shaft, A^1, can be taken from the scale, B^3. The counter-weight, B^2, forms a part of this apparatus, which is combined with the "anchorage" that prevents the brake-band from rotating.

The Modus Operandi.

When using this apparatus, the car is hauled up an inclined plane on to the platform—being either driven backwards by its own power, or being hauled up by pulleys—and after having been attached in the manner already described, safety blocks are placed on each side of the front wheels, purely as a precaution. The car itself is then operated by the driver from the seat in the usual manner. It can be loaded or not with passengers or with ballast, and can, in fact, be driven under almost precisely the same conditions as those under which it works in practice on the road, the b.h.p. on the road wheels being measured on each speed, and with any desired "load" upon the engine. In the Purdue University laboratory a motor-driven fan is used for forcing air at the usual rate of travel against the radiator in the front of the car, and another independent fan is connected up by piping, for getting rid of the exhaust gases that issue from the silencer and delivering them outside the test shop into the atmosphere.

Concluding Remarks.

Such, then, is the apparatus now installed in one of the go-ahead American Universities, and we think that sufficient has been said to show the comparative simplicity of such a plant, as also its undoubted utility. In the main, it is identical with those that have been used in the past for other purposes, and it may also be taken as being similar in general respects to other automobile testing machines that are in course of construction.

Any such machine is naturally too expensive and occupies too much room to be fitted in most public or private garages, but it is sincerely to be hoped that such machines will come into general use before long in this country.

From many points of view it would, we think, be a distinct improvement to substitute a dynamo for the mechanical brake that is generally employed, and thus to absorb the power in a more cleanly manner than is possible when merely dissipating the heat generated in a brake mechanism. An electrical plant of this kind is far more satisfactory from every point of view, even though it costs more money in the first instance, for, in addition to the advantages already mentioned, it is easier to make accurate adjustments and to maintain a constant "load" when the power is converted into electric energy instead of into heat.

* * *

Driving and Mechanical Proficiency Certificates.

BELOW are given results of examinations recently held for the Automobile Club's driving and mechanical proficiency certificates :—

London : *Driving Certificate.*—E. Caleno, H. F. Willoughby, O. Humfrey, B. Hope, E. L. Mason, B. F. Wood, E. E. Martin, J. Swan, F. Bradbury, A. Rowley, R. Freeman, F. Southgate, W. L. Cockle, J. G. Rimmer, A. Dennis.

Mechanical Proficiency Certificate.—M. S. Napier, W. Shawyer, J. E. Davis, H. Charnock, S. H. Smith, W. F. Parker, A. E. Bennett, B. Hope, W. J. Pearmain, E. L. Mason, E. Wenger, A. Scolan, W. L. Cockle, J. G. Rimmer.

Liverpool : *Driving.*—C. Grimshaw, S. Rowbottom, J. S. Lake, J. L. Lewis, W. Cunliffe, W. J. Davies, J. Wilde, H. Wilde, E. Shorland Ball.

Mechanical Proficiency.—F. R. Searle, A. H. Russell, W. Cunliffe, Percy Ely Parr, W. M. Cunningham.

Leeds : *Driving.*—A. Shirley, W. Slinger, C. Sheldon, L. A. Swallow, C. Shagouri, E. H. Hepper, J. F. Warrington.

Mechanical Proficiency.—W. Slinger, J. E. Marsden.

Newcastle-on-Tyne : *Driving.*—F. W. Davis, W. Matthews, E. W. Swan.

Mechanical Proficiency.—E. W. Swan, J. W. Ward.

Darlington : *Driving.*—W. Spink.

Driving and Mechanical Proficiency.—H. S. Reed, J. A. Byrne, T. B. Robinson.

Glasgow : *Driving.*—A. Crane, W. Davidson, James Haning, A. Mackenzie, G. Wallace.

Driving and Mechanical Proficiency.—W. Adie, John Carlaw, W. R. Garside, Robert Sloan, D. Macrae, W. S. Muir, John Russell, John Taylor, J. Turnbull, A. Beveridge.

Edinburgh : *Driving.*—G. H. Brown, A. Binott, A. H. Dye.

Mechanical Proficiency.—E. G. Guest, G. H. Brown.

Dundee : *Driving.*—Wm. Millar, John Drummond.

Driving and Mechanical Proficiency.—John Morris, J. L. Graham.

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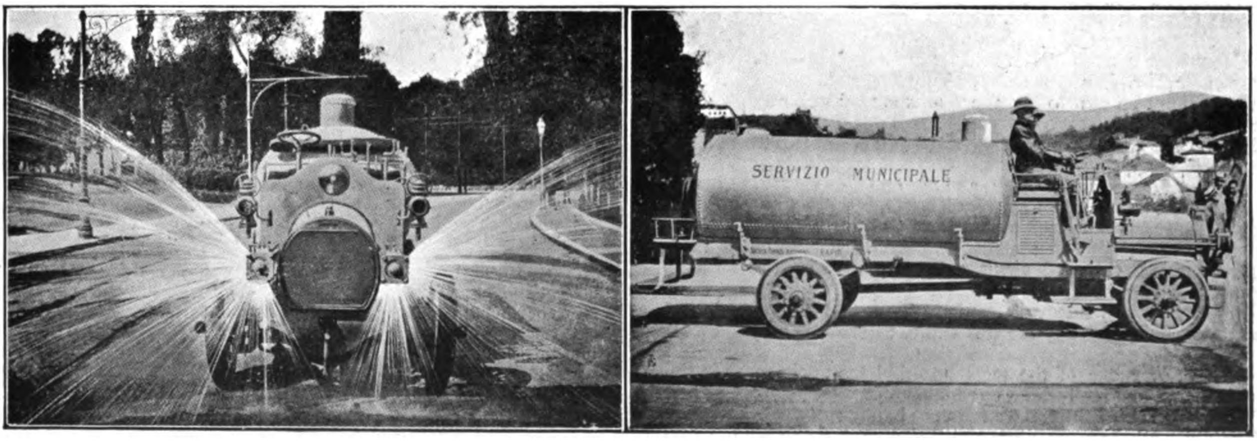
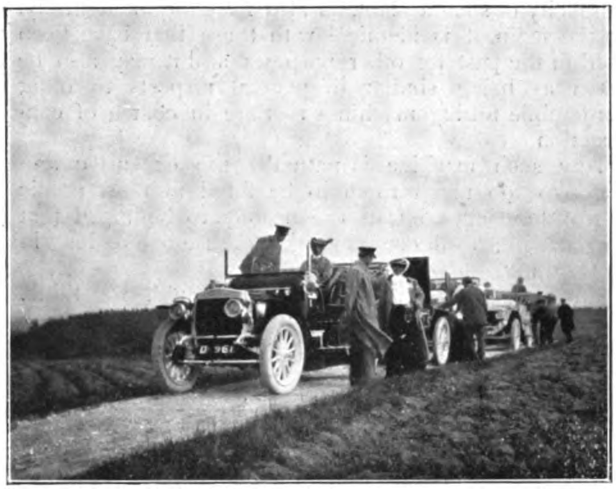


An Italian Municipal Motor Watering Cart at work in Turin and Rome. This machine is one of the latest products of the Turin "Automobili Rapid" Company. The water is sprayed by means of small water-wheels, mounted in front, which are reported to be very effective.

A TRY FOR THE HERKOMER TROPHY.*

By Mrs. Edward Manville.



A TRY FOR THE HERKOMER TROPHY.—
A halt on the journey to Munich, at the top of the Black Forest (1).

I FEEL most awfully nervous, I don't think I ever felt so nervous in my life before. Competing for the Herkomer Trophy did not take half the pluck that it does to tell you about it.

The reason I find myself in this sorry plight is because I want to be a good example; I want to persuade members of our club to go in for competitions, because I most truly believe the very fact of women like ourselves going in for competitions is the best possible thing for the sport, and if they do, I want them to tell us all about it.

My husband and I went in for the Trophy just for fun; we had decided to take our holiday in a motor car in Southern Germany and the Austrian Tyrol in August of last year, and so when we heard that the Trophy was to be competed for in that very district at the very time we should be there we thought it would be fun to compete.

I put it to my husband, diffidently, that it would be impossible for us both to compete in the same car, and, being the delightful husband that he is, he immediately saw my point, and decided I should drive a car just the same as his—a 35-h.p. Daimler.

From the moment that we entered positively tons of literature in German, of which language I do not understand a word, kept arriving at the house. Half of it addressed to "Hochwohlgeboren Herr Maud Manville," and it was quite a long time before we got the secretary of the Bavarian Automobile Club to realise that there was no Herr Maud Manville, only a Frau.

We understood enough to gather that the competition was in four parts. First, an exhibition at which marks were given for appearance, carrossie, and accessibility of parts. Then a hill climb, then a flat race, and then a three days' reliability tour of about 650 miles.

Some friends heard we were going, and decided to join us, so that in all we were five cars, strangely enough all Daimlers. The other four were entered by husbands of our members—Mr. Dawson, Mr. Rendle, Mr. Herdman Ash, and my husband.

You will not be able to see the five cars very well on this slide, but it will give you a sort of general idea of our caravan.

I have only two photographs to show you of our trip to Munich, the centre from which the competition was organised; the truth is that we were eager for the fray, and our one idea was to get on, so we hurried on by the direct road by Rheims, Nancy and Strasbourg. Indeed, many times our run quite partook of the nature of a race, and it was quite fun to see the way the inhabitants of the little villages realised this, and urged and encouraged on the car that happened to be running last.

Only once did we leave the direct road, and that was because we wanted to do a really big hill climb, to see how the cars were running.

We went over one of the most beautiful mountain roads in the Black Forest, and really did a terrible climb.

When we got to the top we felt very happy; our cars had done splendidly. We had got up at six, and now it was only ten, and we had time and appetites for breakfast. However, the dismay of the housewife of the little inn was rather great, when fifteen of us, for we were that number, including the drivers, demanded breakfast immediately, and she knew that her only breakfast was very German sausage and eggs, and the utensils she had only permitted of two eggs being cooked at the same time. You can imagine it took us some time to get our hunger satisfied, and that there was leisure to take this photograph. (Fig. 1.)

We only got to Munich two or three days before the competition, and we had all we could do to get our cars cleaned up and thoroughly examined before the Exhibition.

We were most kindly received by Professor von Herkomer and the representatives of the Bavarian Club, who did their best to explain the tremendous number of rules of the competition to us.

We found that we must, of course, each carry a controller, that only one person would be allowed to touch the engine during the three days of reliability, and that a second man might be carried for tyres; so that filled the car, the driver, the controller, and two men. Our cars were kept in the Exhibition till six on the Friday night, and then we found we had to go 40 miles to the scene of the hill climb. This was rather a nasty knock, because it meant that we should have no chance of trying the hill, and we heard that several professionals had been practising on it for weeks. However, we had to trust to luck. We did not get to Kochel, the village at the foot of the hill, till nine that night, when it was raining cats and dogs, and therefore impossible to try a strange hill. We heard, however, that we might do so between six and seven the next morning, so we all turned out, but we found it impossible to really get up any speed on the hill because all the other seventy-nine competitors were trying it too, and there seemed to be an unending stream of wagons with German beer, and char-à-bancs with people who were going to drink the beer, going up to take up their positions for the day. Of course, we saw what it was like, found that the gradient was really nothing, but the bends appalling and very frequent, and seeing that it was still pouring with rain, or rather a sort of wet mist which makes the roads worse than anything else, the going was likely to be as bad and skiddy as it possibly could be.

Everyone was searching for non-skids, the racing cars had one on each wheel. The men of our party all took upon themselves to warn me most seriously about not taking any risks. There was no necessity to go fast or tear round the corners, as, after all, the hill-climb meant very little. But I was wild when I found that they did not act on their own good advice at all, with the result that two of my party beat my time.

When I took up my position to start the hill-climb (3), flying a Union Jack, I got a tremendous reception, and I realised then for the first time the sort of reception I was going to get right through the competition, and I may say that that reception has been going on ever since.

Only the other day, when I was in Cairo, my husband and I noticed that the waiter at our table was particularly attentive and impressive in his attentions. One day I asked him if he had ever waited on us before, and he said with a sweeping bow, "Madame, did I not see you drive into Baden-Baden?"

I was rather afraid I should not get a good start. The language

A TRY FOR THE HERKOMER TROPHY.—
The cars parked by the Walchensee after the climb up the Kesselberg (2).

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* A paper by Mrs. Edward Manville, read before the Ladies' Automobile Club of Great Britain and Ireland on Feb. 22nd.

Mrs. Edward Manville starting on her Daimler car for the Hill Climb (3).

Mrs. Manville waiting the word to go in the Flat Race in the Förstenrieder Park, in which she accomplished the **fastest time of the day (5).**

A TRY FOR THE HERKOMER TROPHY.

was different, and I did not know what the method would be; but it was perfect. It seemed ages going up the hill. I felt I had been driving up it for years, although it was only 3½ miles long, and only took just over seven minutes. The first thing that cheered me up was that just in the last straight piece I caught up a car that had started two minutes ahead of me.

I think the best cheers I got were from the Royal party, who sat all day in the rain watching the cars. The German Emperor's sister, the Princess of Saxe-Meningen, was herself there all the time, and was deeply interested, she told me afterwards.

After our climb we had to run down the hill the other side, where the cars were all collected by the Walchensee, and we had lunch at the inn there (2). From that moment we started on a career of veal, which lasted for four days. The German idea of supporting the inner man in times of stress is evidently veal.

Next morning we found that my car was fifth of all the cars, my husband's second, Mr. Rendel's third.

Next day was the flat race. It was a perfectly glorious morning, and I knew everything was bound to go right on such a day, and determined to listen to no more good advice.

The race was to take place in a sort of private park; it was nearly four miles long, and the surface perfect.

There were two bends in it, which, although they seemed nothing going at an ordinary pace, became pretty hard to get round at 78 miles an hour.

At the same time as the race for the Herkomer Trophy, there was a race run for racing cars for the Bleichroder Cup, and, funnily enough, the car numbered twelve won the Bleichroder Cup (4), and the car numbered twelve won the Herkomer Trophy.

You will see this car just starting in the flat race (4a). A 40-h.p. Mercedes, driven by Mr. Ladenburg. He was a very nice boy, and he made a very nice picture, I hear; for not only did Professor Von Herkomer give the trophy, but he painted the picture of the winner.

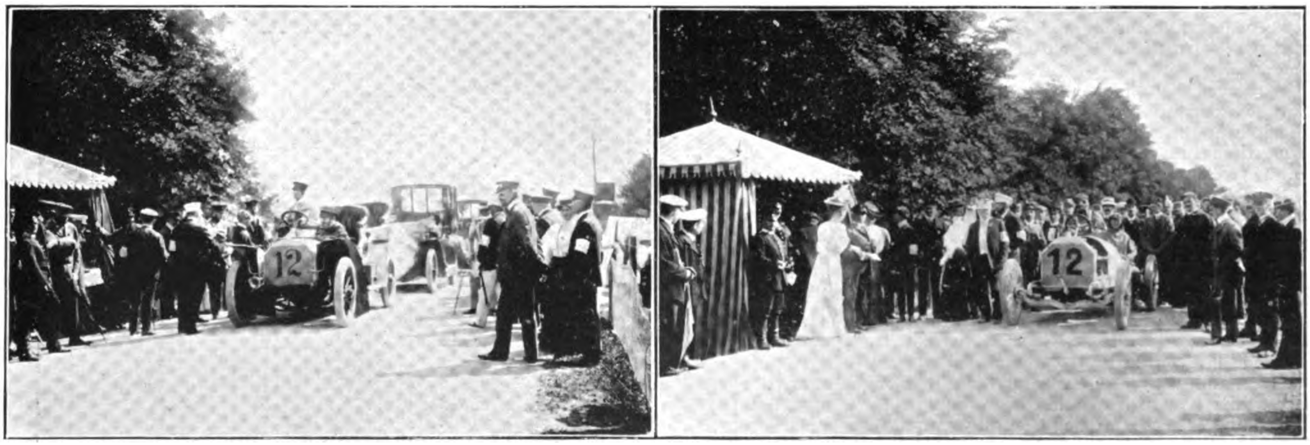
I had only driven over the road once, in the dark, and felt a little anxious about the bends; but what really looked like a bit of very bad luck turned out to be the very best of luck for me.

The bad luck was that the car ahead of me was so slow that, though it had started two minutes before me, I caught it up within the first two miles, and I could not make the driver hear that I was behind and wished to pass, and the people would crowd so on to the road that I dared not attempt to do so. I was heart-broken. I had intended to make such a splash, and here was my chance absolutely gone. Later I got a message that the judges and the Royalties had seen my dilemma, and wished me to have another run (5). So in that way I had a rehearsal, which stood me in very good stead; for, as a matter of fact, when I made my second run, I beat absolutely everybody else by quite a good deal.

My husband came second, then Mr. Rendel, then Mr. Dawson, and after the four English cars only came all the others.

On Monday morning, at 3.30, we had to be in our places for the Reliability Trial. I need not explain that it was impossible to take a photograph of the start. It was really most dreary—dark and awfully cold. However, a beautiful sunrise soon changed all that, and I was beginning to feel that the most delightful thing in the world was a reliability trial, when suddenly I had my first tyre trouble, and that meant I was absolutely out of the Trophy. The penalty for punctures was very severe, and, besides that, there were sure to be lots of cars that would go through without any, so that it was quite certain that one loss of marks such as I had would put me out.

We ran about 20 miles between controls, and had to do the distance in about an hour and a quarter or an hour and a half. The



A TRY FOR THE HERKOMER TROPHY.—Herr Ladenburg on his 40-h.p. Mercedes, the winner of the Herkomer Trophy for Tourist Cars (4a on the left), and on the right (4) Hieronymus on his 90-h.p. Mercedes, the winner of the Bleichröder Cup for Racing Cars. Both cars, it will be seen, by a coincidence, bore the number 12.

A TRY FOR THE HERKOMER TROPHY.—Mrs. Manville's arrival in Munich at the end of the Reliability Trial, when the front of her car was almost smothered by a huge laurel wreath (6).

fact was that everybody went pretty fast at first, and then had to while away time just outside the controls.

Quite towards the end of the day, as we were nearing Baden-Baden, our stopping place for that night, we passed a big hotel, where there were a number of people waiting for the cars, and there I saw three great big Germans, with the proper sort of scars all over their faces, standing with three glasses. They called out to me to stop. I asked my controller's permission, which he gave—I expect he saw the glasses—and then these men came up to me and said they had been waiting and watching for me to come, and had each of them got a drink, one beer, one wine, and one milk to offer for my refreshment. I took the milk most gladly, and suggested that my controller would enjoy the beer. That day's run was 250 miles.

We had to lock up the cars at night in the presence of the controller, and we were allowed half an hour in the morning to get the cars ready for the day, again in the presence of the controller. To do this was quite hard work in half an hour. One man oiled the engine and the other filled up with petrol, which took all the time, because everybody was scrambling for petrol at the same moment, so I filled up with water and dusted the seats, &c., myself.

Next day it was quite an early start, 5 a.m. and just daylight. A most beautiful rosy sunrise greeted us as we climbed the hills out of Baden-Baden. As the day wore on it got very hot, and by the time we stopped for lunch there was such a scorching sun that we had to get hold of anything we could in the way of covers to protect our tyres. After lunch I was running in front of my husband, who was then first favourite for the Trophy, and how I was hoping he would get through all right. You can imagine my distress when I heard his tyre go. I felt absolutely sick, and turned to my controller and said, "Please may I stop and cry?" He gave me a severe look, and said, "No, go on," and then he began turning over the pages of his enormous book of instructions as fast as he could, to see if there was any rule for drivers who wanted to stop and cry, but found none. After about five minutes' meditation, at my request, he turned and said to me, "You may go to your husband;" but then I didn't want to—there was really nothing to be done.

We stayed that night at Nuremburg, having done 240 miles that day. Next morning we were warned to go slowly, and in any case I had never run very fast, as I felt my car had vindicated itself as being the fastest car, and there was no need to put any extra strain on the tyres.

But often my controller was annoyed that other cars passed us; he wanted to realise all the time that he *was* on the fastest car, and after we left Nuremburg he began to urge me to go faster. He said "We will pass that car," but I said, "Oh, no; we do not want to pass." "Oh, yes; I will not take his dust." "But," I urged, "if we pass him we shall get somebody else's dust." "Well, we will pass him." Then I used my last argument: "Oh, but we can't; he is a Prince." "Prince of no land, go on," said he.

At the last control Professor Von Herkomer was waiting to greet the cars, and, with his usual happy knack, managed to say the very nicest thing he possibly could to everyone.

Running into the Munich Control was quite an ordeal—ever so many Royalties were collected there—and when I made my appearance the people cheered, a band played our National Anthem, and the club presented me with a most magnificent laurel wreath about 6 ft. in diameter, and tied up with Bavarian ribbons (6). The Princes all congratulated me, and were most kind in all they said, and I was only too glad to be able to say how wonderful I thought the management and organisation of the whole thing had been.

The next day we were all invited to the Palace of Prince Ludwig of Bavaria, and I was presented to the Princess and to him, and he then made a point that I should go to the banquet which was to be given that night to the owners and drivers of the cars. I had had no intention of going. Just imagine being the only woman among 270 men; but I could not get out of it after Prince Ludwig's request, so I took my courage in both hands and went.

I wonder if any of you have ever been to a German banquet—it is so funny. The speeches come between the courses, so that it takes a very long time to get along with the dinner, and, as a matter of fact, lobster salad was handed at ten, and at a quarter past eleven, when I left, the part I am interested in, sweets and dessert, had not yet made their appearance.

It was hors d'œuvres, then a toast to the German Emperor, soup, Prince Henry of Prussia, fish, and to my horror, Mrs. Manville. I wondered what I was to do to acknowledge it, my husband was ever so far away, but Prince Ludwig himself solved my difficulty by "prosting" with me, that is clinking glasses, immediately after my health had been drunk. Then every man in the room did likewise. The beautiful menu, designed by Professor Von Herkomer, you see on the slide, showing the Future bound to an automobile.

Now that the Trophy was run for and won, we were at liberty to explore the beautiful country lying south, which, as a matter of fact, happens to be part of the road for this year's course. You will see Hochfünstermintz in the Unter Engadine (7) on my slide, and the next one shows the road leading along the Inn to Landeck (8) along which we had to go to climb the Vorarlburg Pass. This pass is the one on the Paris-Vienna road, over which the Gordon-Bennett Race was run, which Mr. Edge won, and it was here that one of the drivers—Hemery, I think—drove right over the side and toppled down, without doing himself any harm, but the car was badly damaged. Right on the top of the Vorarlburg Pass there is a monastery where we went for milk, and paid a visit to the little chapel, which is dedicated to St. Christopher, very appropriately, as St. Christopher, as you all probably know, is considered in France the patron saint of automobilists.

The roads were most picturesque, very good surface, and beautifully engineered; you will see the tunnels right through the mountains (9).

A TRY FOR THE HERKOMER TROPHY.—Hochfunstermintz in the Lower Engadine (7).

Being free-lances in our good motor cars, we were able to dodge about the country as we liked, and, hearing the play was on at Oberammergau (10), we decided to go there. We made a most romantic entry to the little village. We did not get there until about midnight. The road is very winding and mountainous, and every time we turned a corner it seemed as if the mountains shut up behind us as we went into the heart of the world where no one could follow us. The most beautiful moon was shining, and by its light we could see everything perfectly. Up and up we went, wondering when we should reach the wonderful little town. But we knew when we had got there, for suddenly a big crucifix was to be seen by the roadside, and, seeing it, we felt quite certain that we had reached our destination.

Near Oberammergau there is a wonderful monastery at Ettal (frontispiece), which is most interesting. It has a beautiful ceiling in the church, interesting relics of martyrs, and *such* a view out of the gateway, looking towards Oberammergau, and taking in the wonderful crucifix on the top of the mountain which overshadows that place, and which is so enormous that no one can imagine however it was got there.

Of course, we had no end of frontiers (frontispiece) to pass with all this dodging about, and it was often a difficult problem for the officials to find enough money to pay us off as we left a country. On one occasion it could not be managed, and I do not know exactly what he had to do; but the gendarme took us to another place where he got the money. He dare not leave the cars till they had passed the frontier, where stood the man with the gun, so went two miles with us to the next country and waited to see us over the boundary, and then had to walk two miles back in the pouring rain. At another frontier we had a funny experience of red tape. My husband happened to stop his car with the two front wheels in Germany and the two back ones in Switzerland, and the officials would have nothing to say to him until he had backed the whole car into Switzerland. You will see the gendarme directing the operation.

When we crossed the Austrian frontier we found ourselves in the country of "langsam." It was the only place where we saw the people really in costume, and most picturesque it was to see them on their bicycles and walking in their green leather clothes, and pleasant to hear them yodelling to us in a friendly way.

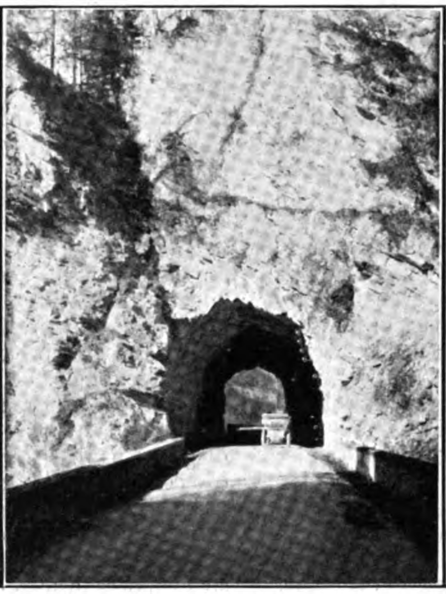
We spent very little time in Switzerland, and that in the southern part, and were principally interested there in the strange wooden-covered bridges, one of which you will see on this slide; the next will show you a view of the bridge taken from a hill above.

We wanted to go to see the falls of the Rhine at Schaffhausen, and after that we made a bee line for England, having enjoyed every bit of the tour. There was only one crumpled rose leaf in the seat of my car, and that was that the Trophy was not in the back.

The photograph will give you some sort of idea of the beauty of the Trophy, but of its making and its meaning I do not mean to tell you anything, as Professor Von Herkomer is here and has been good enough to say he will tell you himself.

He took enormous pains over the whole thing, not only over the Trophy, but over the organisation and actual carrying out of the competition itself and in the competitors, proving himself, if possible, as great a sportsman as he is an artist.

Along the Inn to Landeck, the road to the Vorarlburg Pass (8).



A tunnel on the road from the Lower Engadine towards Landeck (9).

Oberammergau (10).

A TRY FOR THE HERKOMER TROPHY.

Hard Swearing.

A fine sample of police prosecution—or persecution, take it which way you will—was provided recently at Highgate when a motor 'bus conductor was declared by a policeman to have been intoxicated while in charge of his 'bus. When he was brought in even the police surgeon said he was sober, but the prosecuting policeman still maintained that he was drunk while on duty, and perversely got sober on his way to the police station—a very useful art, no doubt, for those who can acquire it. It so happened, however, that the magistrate's clerk was on the 'bus at the time, and maintained that the conductor was not drunk, so the charge was dismissed. It is to be hoped that with the new ordinances which are to be issued by the new Government for the police, we shall see less of this scandalously unfair style of prosecution.

Motor Car Paper at Liverpool.

On Wednesday of last week an interesting paper was read before the Liverpool Engineering Society by Mr. Ernest A. Rosenheim, B.Sc., entitled "Motor Car Practice in 1905," the president, Mr. J. Reney Smith, M.I.M.E., M.I.N.A., occupying the chair. The paper was of a comprehensive character, embracing the chief constructional tendencies of petrol car construction, and was illustrated with a considerable number of photographic reproductions and drawings—most of which were placed at Mr. Rosenheim's disposal by The Automotor Journal. A considerable amount of attention was devoted to the subject of ignition, magneto systems being referred to at no small length. Carburettors were also dealt with in some detail, and Mr. Rosenheim referred to the strong reasons that there are for striving to use heavier or cheaper fuels than petrol.

THE MULTI-CYLINDER QUESTION.

On pages 71 and 72, in The Automotor Journal of January 20th last, an attempt was made to show the real relative merits of engines having 1, 4, or 6 cylinders from the point of view of steadiness of running and of inherent flexibility—steadiness of running owing to the evenness of the torque (twisting strain on the crank-shaft), and flexibility owing to the non-requirement of a heavy fly-wheel. Probably the most striking point then brought before the notice of our readers was that the "torque" on the crank-shaft of a petrol engine is affected to an enormous extent by the weight of the reciprocating parts, and that the strains which are set up by starting the pistons from rest immediately after each dead-centre, and by bringing the pistons to a standstill at each dead-centre, are of very considerable intensity, even in comparison with those set up by the great changes of pressure that act upon the pistons in the combustion-chambers.

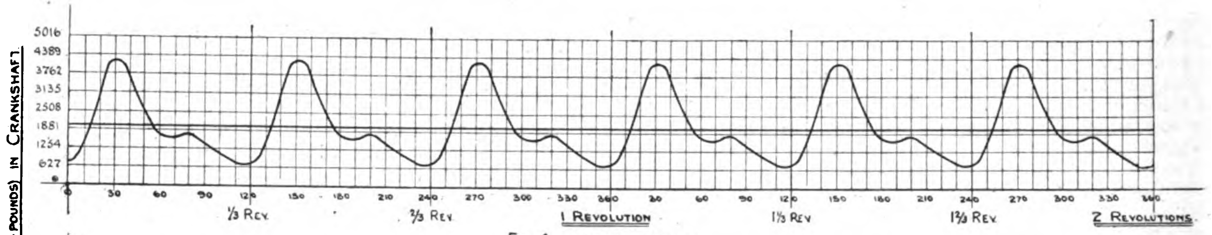


Fig. 4. Six cylinder engine.

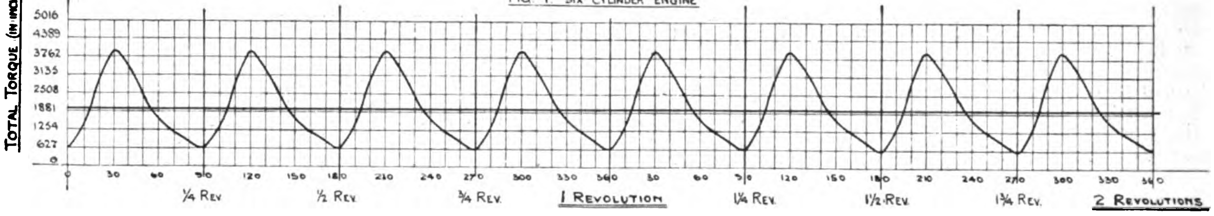


Fig 6. Eight cylinder engine.

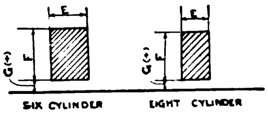
The diagrams that we then published, in order to demonstrate these facts in a graphic manner, were, it will be remembered, prepared by Mr. S. F. Edge, and were based on data obtained by him from a 6-cylinder Napier engine of 4-in. bore by 4-in. stroke—an engine having unusually light pistons and connecting-rods. They, moreover, only referred to engines having one cylinder, four cylinders, and six cylinders, and did not include corresponding curves for those having eight cylinders. Now, however, Mr. Edge has supplemented his previous work by sending us a comparative torque-diagram for an 8-cylinder engine of similar power, and this we now reproduce to the same scale as before, together with the 6-cylinder diagram. Accompanying them are our own rectangular diagrams, which sum up in a simpler form the three main points that are deducable from the more comprehensive curves.

As would be expected, the diagrams which we now publish show that the length of time which intervenes between the impulses (the dimension E) is less with an 8-cylinder engine than with a 6-cylinder engine, and that the extent to which the torque varies (the dimension F), is also less with the engine that has the greater number of cylinders. It will, however, come quite as a surprise to many motorists to notice that the torque actually falls to a slightly lower degree on the 8-cylinder crank-shaft than it ever does on the shaft of the 6-cylinder engine. This practically means that the 8-cylinder engine requires a slightly heavier fly-wheel, in relation to the 6-cylinder, than would at first sight be anticipated, and certainly appears to bear out Mr. Edge's contention that it is quite consistent to be an advocate of 6-cylinder construction without being in favour of merely multiplying the number of cylinders indefinitely.

Fig. 5. Diagrammatic Summary showing relative theoretical merits of 6 & 8 cylinders.

Explanation.

E = Interval between impulses.
F = Unevenness of torque.
G(+) = Absence of dead centre.



What is apparently demonstrated by our present diagrams is that for engines of a certain power, at any rate, there is no such material gain in going a stage further (adopting eight cylinders) as there is in employing six cylinders instead of four. It is, of course, quite true that more cylinders lead to greater steadiness of running, and that, for engines of the same power, higher speeds can be obtained in consequence of the reduced weight of the reciprocating parts, but as regards any very strong merits of special character affecting one particular type of engine as against another, six is evidently the highest number to attain which it is worth while making any real sacrifice—such as prime cost, risk of trouble, &c. Primarily, however, the number of cylinders is bound, in the future, to depend on the amount of power required, and upon the speed at which the engine has to run.

An American "Motor Way."

In the United States a "motor way" is projected by Mr. J. Brisbane Walker, working with the A.C. of America, from New York to Philadelphia. The suggestion is that it should be 82 feet wide, divided into six sections, three for each way. These are respectively to be used by (1) slow motor vehicles, (2) those travelling at 30 m.p.h., and (3) high speed machines.

Manchester Exhibition.

At St. James's Hall, Manchester, a fine display of motor vehicles has been brought together under the guidance of Mr. Walter Cawood, working on behalf of the Motor Trades Association. The attendance of the public has been very great during the week, the close taking place to-night (Saturday).

CORRESPONDENCE.

. *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

FOUR-CYLINDER AND SIX-CYLINDER CARS.

To the Editor of The Automotor Journal.

Sir,—With regard to this much-debated question of the relative merits of four and six cylinders (especially in connection with petrol consumption and wear and tear of tyres), and the proposed competitions between four and six-cylinders, I have been interested to watch the varying phases. I have taken the trouble to analyse the correspondence that has appeared in connection with it, and must say there has been a tremendous amount of talk for a very small result.

On December 2nd, in reply to criticism as to petrol consumption in 6-cylinder cars, Mr. Edge challenged Mr. Jarrott to do battle between two 40-h.p. cars, the suggestion being that Mr. Jarrott should run a 40-h.p. 4-cylinder De Dietrich against a 40-h.p. 6-cylinder Napier. He suggested that the two cars should keep together and be tested under identical road conditions, and Mr. Edge offered to run weighted chassis if more convenient for Mr. Jarrott. Mr. Edge mentioned that, failing Mr. Jarrott accepting the test, he would run a 6-cylinder Napier under club auspices, which, I believe, he has since done. Mr. Jarrott accepted the challenge with modifications, preferring to run a 40-h p. Crossley instead of the foreign-made car. I may have missed it, but I have not heard anything more in connection with this proposed match.

The next thing that happened was that Mr. Arnott wrote urging the advocates of the two types to compete; then came Capt. Deasy on the scene, challenging all and sundry 6-cylinder cars to race over a distance, say, of 100 miles. By his letter, Capt. Deasy seemed anxious to back the business both ways. This drew an acceptance from Mr. S. F. Edge, he accepting the challenge for a 6-cylinder Napier car against a foreign 4-cylinder, and offering to cross to the Continent with Capt. Deasy to decide it. At the same time, Mr. C. Johnson wrote accepting Capt. Deasy's challenge, but making it a "perfection" trial.

Following this, Capt. Deasy wrote as to the two possible acceptances, but objecting to both, to Mr. Edge's because his car was too fast, and to Mr. C. Johnson's because his tests were too comprehensive, and gave his own ideas of suitable conditions.

A great number of people are interested in this matter, and it seems a pity something absolutely definite cannot be arranged. With this end in view, I have sketched out below conditions that would settle the points at issue.

Test to be over a 100 (?) miles of give-and-take road. Points to be inquired into:—

1. Horse-power, say 40.
2. Minimum number of revolutions of engine per minute, car standing.
3. Maximum number ditto.
4. Slow running of car on top gear, clutch not slipping.
5. Fastest speed on the same gear.
6. Ability to take hills on same top gear.
7. Silence when running on top gear.
8. Cars to be of the same total weight: differences to be made up by ballast.
9. Cars to run between two observing cars about 100 yards apart.
10. Petrol consumption to be taken.
11. Engine to run all the time, and not allowed to be switched off going down hill.

G. S.

South Ealing, Feb. 21st.

To the Editor of The Automotor Journal.

Sir,—I am very interested indeed in all the correspondence in your valuable paper which relates to the unprecedented superiority of the 6-cylinder car.

I think that to have run a car on top speed from Brighton to Edinburgh, with a consumption of only 18 miles to the gallon, would have been such a feat as would have proclaimed for ever the merits of the 6-cylinder principle; but it has not yet been done!

The much lauded performance has had a bad shake up since the publication of the fact that the car in question was geared down by 4 sprocket teeth.

I, for one, am greatly disappointed that the performance should have proved—nothing newer than the fact that even my old 8-12-h.p. Phœnix Panhard, or anybody else's, could have accomplished the same with the greatest ease—if geared low enough!

No doubt the claim of the 6-cylinder car to be wonderfully easy on tyres is again substantiated by the official report of the later trial.

In ending this letter, which I hope may not be encroaching on your valuable space, I may remark that the probability of my old car, minus four sprocket teeth, being able to get up Netherhall Gardens on its top speed is not so remote as some of the disciples of the 6-cylinder car might imagine!

Q.E.D.

February 19th, 1906.

To the Editor of The Automotor Journal.

Sir,—I was very interested to read the letter in your issue of February 24th from Mr. W. M. Letts, who seems to have some queer ideas as to what is required in a touring car. His theory is, apparently, that variation in speed by means of the throttle and sparking-levers is not a thing to be desired. Has your correspondent ever been on an up-to-date motor car? His idea appears to be to provide racing experts with ease, comfort, and simplicity, but to deny the same comforts to the owner of a touring car.

If ever there was a case of "sauce for the goose being sauce for the gander," surely this is one, and I cannot for the life of me see why a racing man, who is an expert, should be coddled, and, at the same time, the ordinary owner be condemned to speed variations obtained by means of a speed lever and frequent use of the clutch. It would be interesting to know from Mr. Letts at what point exactly a flexible engine with delicate throttle and sparking-lever control ceases to be desirable in connection with a touring car. If such is the case, it logically follows that Mr. Coleman's advertisements of his White steam car in the same issue of your paper, in which he claims elasticity and ease of control, are in reality drawbacks to his touring vehicle, though they might conceivably, according to Mr. Letts' theory, be of use in a racing White steam car.

The De Dietrich people claim that their car is like an electric vehicle. We all know the chief points of an electric vehicle to be ease of control and absence of speed-changing mechanism.

With reference to the Crossley car, I find such meaningless phrases, as "engine will be extremely flexible, and it will be possible to drive the car at a slow speed even on top gear," and, "the control of the engine will be secured by two levers on the steering-wheel, one operating the mixture, the other the sparking, whilst at the same time a foot accelerator will be fitted."

Surely Mr. Letts cannot be in touch with current motor matters or he would not have written a letter so contrary to all well known motor advertisements. Captain Deasy, too, I notice, describes his Martini as a beautiful flexible engine, mentions ease of control, and a decelerator pedal giving foot control as a further refinement.

Delaunay-Belleville people, too, speak of the unique flexibility of their engine. The Hotchkiss people also advertise their 4-cylinder cars as "silent and flexible as a 6-cylinder." Surely the firms in these advertisements do not merely refer to their racing cars and not to their touring vehicles; but, according to Mr. Letts, if the remarks do refer to touring vehicles, they are not desirable properties.

It would be interesting to know whether Messrs. Coleman, Delaunay-Belleville, Hotchkiss, and Captain Deasy, &c., look upon these points as desirable in touring vehicles, or whether their advertisements are concerned only with racing cars.

Incidentally, the number of gentlemen who advertise their cars on the same lines, apparently to a misguided public, might be added to almost indefinitely.

Yours truly.

J. Lambert.

PROGRESS AND A GUARANTEE.

To the Editor of The Automotor Journal.

Sir,—The present moment is a particularly interesting time from the British motor manufacturer's point of view. For the first time in the history of the movement the British manufacturers have made in this country far more cars in a month than were imported; the British manufacturers made motor cars during January to the value of not less than £468,000, and this, remember, is made up merely from the principal firms. There are a large number of smaller firms who have not been included. The total imports of foreign cars into Great Britain during the same period was £317,000.

I have been in touch with a very large number of the British firms who state their January outputs are not anything like as large as they have arranged for future months; they are nearly all increasing their factories, therefore, during 1906, there will not be less than five million pounds' worth of motor cars manufactured in this country, and, best of all, nearly all the cars manufactured in Great Britain that go to make up the totals I have given you are made by firms who are making splendid vehicles.

In regard to the Napier, the progress is still extremely satisfactory, and the latest development is that having found from actual experience with a very large number of 6-cylinder Napier cars which have been in the hands of our clients, and have been used and driven under ordinary conditions, that the extraordinary reduction in wear and tear that has made itself evident compared with 4-cylinder cars, enables me to give a guarantee with every 6-cylinder Napier I turn out, to extend over a period of three years from the date of purchase. This, I think you will agree with me, is one of the greatest proofs which can be given of the perfection attained by the Napier principle of using six cylinders, coupled with the world-wide reputation that high-class British workmanship and material has, and it is interesting to note that the foreign manufacturer has never been able to give anything like such a guarantee with his foreign vehicle as is now given with the 6-cylinder Napier.

Yours truly,

Feb. 24th. S. F. EDGE.

BRITISH OUTPUT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Mr. S. F. Edge made a public statement on the evening of February 24th in respect to the present value of cars manufactured in Great Britain.

While thoroughly in accord with Mr. Edge's endeavour to demonstrate the fact that our home manufacture of motor cars to-day exceeds in value the imports of foreign-made cars, we are entirely unable to understand how Mr. Edge has arrived at his figures.

We may say for ourselves that, when approached on this subject, we declined positively to state the value of our monthly output, but nevertheless gave certain information as to the number of work-people employed and the amount of our weekly wages bill. At the time of asking for this information Mr. Edge sent us certain particulars with regard to the output of various other companies, and we can only say that if Mr. Edge's statement has been based on an assumption from the figures as submitted to us, we think—while making every possible allowance from a patriotic point of view—it would be best to accept these figures with a good deal of reserve.

Yours faithfully,

For THE WOLSELEY TOOL AND MOTOR CAR CO., LTD.,

J. D. SIDDELEY, General Manager.

February 26th, 1906.

THE FLYING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In answer to Mr. Roe's letter, I understand his model to be 40 ins. long by 6 ins wide, weight 12 ozs., scale $\frac{1}{12}$.

Now, as this model has only one rear rudder, and one front controlling curve, I take it to be a model of the Wrights' last gliding machine, but this only had a length of 32 ft. by 5 ft., weight 108 lbs., so fail to see that it can be to a scale of $\frac{1}{12}$.

Then again, the power flyer, 40 ft. by 6 ft., has two front controlling curves and rear rudders, but as the weight is considerably more than 108 lbs., I do not quite see that it can be a scale model of this.

Like Mr. Roe, I think the success that will be obtained this summer will prove epoch making in the highest degree.

Yours truly,

MICA CAM.

Acton, February 25th.

DETRIMENTAL BRAKES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I think it would not be amiss to call the attention of your readers to the advisability of paying special attention to the methods now universal in driving cars with cardan shafts. It has frequently come to my notice of late that drivers and owners are ignorant of the fact that to use a foot-brake that is connected to the propeller-shaft, or to the projecting shaft from the gear-box, is disastrous and destroys more quickly than anything else the life of the small pinion. As the cardan shaft is now almost universally used, it is more necessary that this explanation would be of help to all motorists, because they have studied and read and learnt mostly from the chain-driven car; and when driving with notable drivers, I have been surprised to see how severely they have used their foot-brake, without considering the effect on the life and the wear and tear of the back-axle; whereas, if side brakes were used when de-clutching, the strain is only distributed on the road wheels, and, generally speaking, the purchase of a hind brake is a third greater than the foot-brake, and the fact must not be overlooked that when the foot-brake is used it is the means of causing a backlash, and a great strain on the differential and the small bevel pinion, which is generally keyed on to the cone of the propeller-shaft.

Yours faithfully,

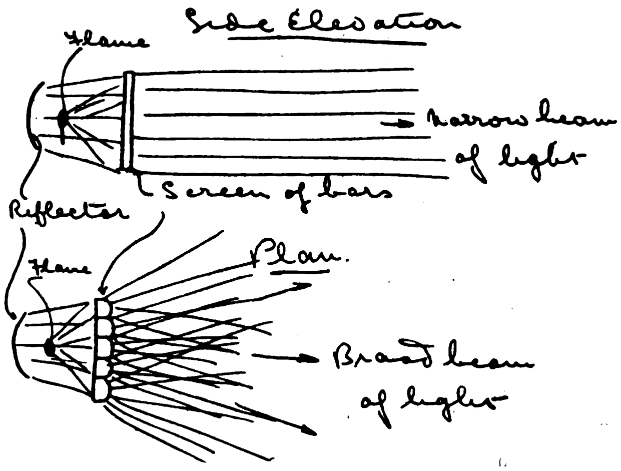
Feb. 23rd. F. F. WELLINGTON.

[The point raised by Mr. Wellington is very similar—although applied to less drastic conditions of working—to that raised in our front editorial paragraphs last week, when we deprecated the suggested employment of the engine as a brake on heavy commercial vehicles.—ED.]

GLARING HEADLIGHTS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Regarding the question of the annoying glare from headlights, I should like to call attention to the practice of marine searchlight makers, when designing searchlights for use on the Suez Canal and for entering harbour where the naked lights would dazzle other shipping. The usual practice is to place a removable screen before the light, made of vertical bars of glass, as shown in sketch. These bars are flat on the side nearest the reflector and convex on the outside, the rays of light being thrown in a narrow and wide band, horizontally. It is quite easy to look at a searchlight so fitted, when only a few feet outside the area of light, although still in the full glare when the screen is removed. This system seems particularly applicable to headlights, as it does not waste somewhere about 50 per cent. of the light, as must occur when frosted half glasses and similar devices are used, but, on the contrary, collects every ray available and throws it right where most needed. The bars, being small and of simple section, would not be expensive to renew in case of breakage, and require no fantastic lenses worth their weight in gold as used at present. Trusting that someone who has had the necessary experience may be coaxed to give us some useful data on the subject.



Yours truly,

Feb. 26th. G. TILGHMAN RICHARDS.

"HONOUR TO WHOM HONOUR IS DUE."

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In the *Standard* of the 22nd inst., it is stated that the original 6-cylinder car was a Spyker, and that this was on exhibition at Paris in 1902, and at the Crystal Palace in 1903.

In the report which appears in the issue of the *Standard* of the 26th inst., concerning the dinner which was given by Mr. Edge on Saturday last, it is stated that I said it was true that a Spyker car with six cylinders had been running before the appearance of the 6-cylinder Napier.

As a matter of fact, on Saturday night I tried to make it clear that so far as I could ascertain the *Standard* was incorrect in stating that the Spyker car was exhibited in Paris in 1902.

Through the courtesy of Mr. Edge, I am able to enclose an extract from shorthand writer's reports on what I said on Saturday night.

This matter is of some interest; I should be glad if you would correct me if I am wrong in stating that the Spyker was not exhibited until December, 1903, whereas the Napier car was running, and its appearance was publicly announced on the 24th October, 1903

With reference to the remarks made by the Birmingham correspondent of the *Standard*, in the issue of the 22nd inst., may I be permitted to state that immediately Capt. Deasy issued his challenge, I wrote accepting it.

I am the first to acknowledge that the credit for introducing the 6-cylinder car rightly belongs to Mr. Napier and Mr. Edge. The Birmingham correspondent has no more right to presume that the 6-cylinder Rolls-Royce car is a copy of the 6-cylinder Napier car than he has to presume that the 4-cylinder Martini car is a copy of the 4-cylinder Panhard and Levassor car which was run in the Paris-Marseilles-Paris Race of 1896. In both cases the number of cylinders is the same. But if I have no right to take up a challenge issued in connection with the 6-cylinder car because the Rolls-Royce was not the first car built with 6 cylinders, then Captain Deasy should have no right to appear as the champion of the 4-cylinder cars with a Martini car, since the Panhard, and not the Martini, was the first car built with four cylinders. And, after all, I think it will be granted that Mr. Edge is quite capable of defending his rights, without the assistance of the gentleman in Birmingham.

Yours faithfully,
C. JOHNSON.

February 27th.

Enclosed Extract from Report of Speech by Mr. Claude Johnson at a dinner given by Mr. Edge, Feb. 24th, 1906.

"Quite recently, within the last few days, he saw in a paper a mistake which he thought ought to be rectified. It was said that a 6-cylinder car had been shown at the Paris Exhibition of 1902, of a make which was not Mr. Napier's make. Now, he thought that was a slight error. He asked his friend, Mr. Spooner, of THE AUTOMOTOR JOURNAL, to make a search, and Mr. Spooner had kindly stated that so far as he could ascertain the 6-cylinder Napier car was first described in October, 1903, there being a car running at that time, while the foreign 6-cylinder car which was mentioned in the column referred to, and which was said to have been exhibited at the Paris Exhibition of 1902, was not—so far as he could ascertain—shown until the Paris Exhibition of December, 1903. This was quite a different matter; but apart from Mr. Edge having made the first 6-cylinder car, Mr. Johnson did not think that anyone would deny that it was Mr. Edge who first put a 6-cylinder car on the market as a commercial article. That honour must rest with Mr. Edge and Mr. Napier."

* * *

RACES, RECORDS, AND TRIALS.

Circuit Européen.

"THE de'il tak' the hindermost" will probably be the motto of the 5,000 kiloms. rush through Europe in July and August next, to be known as the Circuit Européen. That it will resolve itself into a mere scrambling race, with its consequent serious drawbacks, there can be little doubt, owing to the decision by the foreign club delegates in Paris to suppress the official observers on the cars, relying for the chief point in the classification upon the times taken at starting and arrival. Breakdowns, from whatever cause, will be taken no notice of, so long as competitors arrive daily at their mid-day and finishing points within the specified official times. What this will mean can only be estimated by those who have taken part in some of the Continental "go-as-you-please" jaunts—not forgetting the historical Paris-Madrid calamity. On arriving at the awards, the makers of the cars will receive the medals, not the drivers.

The commencing date has been altered to July 26th, and the finish on August 15th, making 21 days, 6 of which will be devoted to exhibitions, and 15 to racing. The daily itinerary otherwise remains practically the same as given in THE AUTOMOTOR JOURNAL of February 3rd.

Weighing-in of cars is to extend over 3 days, viz., July 23rd, 24th, and 25th.

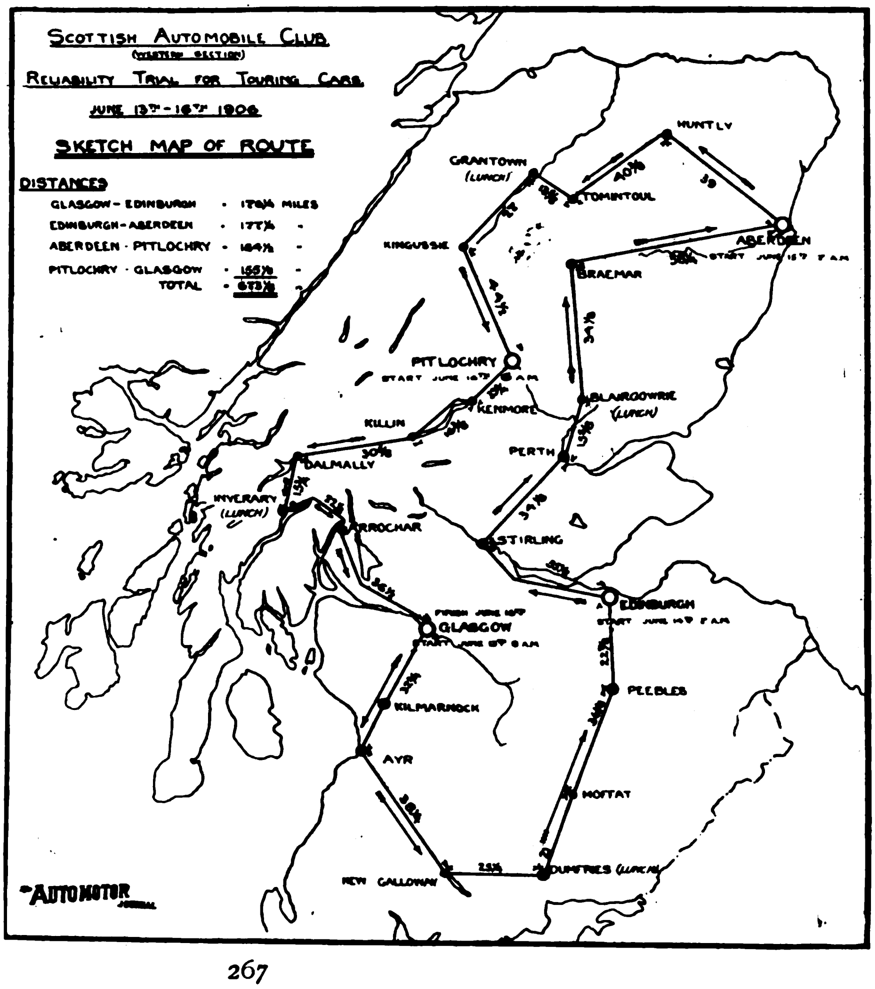
A category for steam cars, based upon the heating surface of the boiler, is to be created.

Paris-Nice Record.

A REMARKABLE journey is reported to have been made last Saturday by Baron de Caters. Starting at 7 a.m. from Paris, on a 120-h.p. Mercedes "Tourist" car, he arrived at 10.45 p.m. at Nice the same day.

Scottish Reliability Trial.

THE Scottish Automobile Club (Western Section) have now issued the rules for this year's Scottish Reliability Trial for touring cars, which is being held from June 13th to 16th next.



On this occasion, the route, which is well shown in our specially prepared sketch-map, will be as follows :—

First day : Glasgow, Ayr (*viâ* Kilmarnock), New Galloway; Dumfries, Moffat, Peebles (*viâ* St. Mary's Loch), and Edinburgh, 176¼ miles.

Second day : Edinburgh, Stirling, Perth, Blairgowrie, Braemar (*viâ* Spittal of Glenshee), and Aberdeen ; 177¼ miles.

Third day : Aberdeen, Huntly, Tomintoul, Grantown (*viâ* Bridge of Brown), Kingussie, and Pitlochry ; 164½ miles.

Fourth day : Pitlochry, Kenmore (*viâ* Struan and Tummel Bridge), Killin, Dalmally, Inveraray, Arrochar (*viâ* Glen Croe), and Glasgow (*viâ* Loch Lomond) ; 155⅛ miles.

making a total distance of 673⅛ miles.

The main alterations in the rules are (*a*) the classification, which will be by price ; (*b*) a non-stop performance is not now essential to eligibility for a medal award. This decision has been arrived at after very careful deliberation, in view of the fact that it has been considered that a hardship was apparent as regards several cars which last year lost their non-stop certificates through "driving stops" or other minor causes. Stops for tyre troubles have been altered, and the system of making the awards is on an entirely new basis. The following are the main points of the rules :—

Entries.—In each class only one car of any specific make, type and h.p. will be accepted, and no cars will be considered of different horse-power unless the cylinder capacities vary by at least 15°/ₒ. In accepting entries, preference will be given to those by (1) a maker, or (2) the nominee of a maker.

The classes will be as follows :—

	Petrol vehicles.	Entrance fee.
A.	Selling price of chassis up to £200	12 guineas.
B.	,, ,, £200 to £350 ...	12 ,,
C.	,, ,, £350 to £500 ...	15 ,,
D.	,, ,, £500 to £650 ...	15 ,,
E.	,, ,, over £650	15 ,,

F. Steam cars.—The fees of Class F are the same as for the respective petrol classes, according to price.

The Committee may sub-divide any class, combine any classes, or create any new class if deemed desirable. Petrol cars showing more than 12 h.p. on the following formula must have a seating capacity of at least four :—

$$\frac{\text{Cylinder diameter in inches}^2 \times \text{number of cylinders.}}{3}$$

Objects.—The trial is one essentially of reliability, with the object of demonstrating the suitability of modern motor vehicles for touring purposes. It will form, for all practical purposes, a "non-stop run." Maximum and minimum times will, as usual, be fixed for each respective class of vehicle for covering each road section of the trial, having due regard to the nature of the roads and towns and villages to be traversed, and to the reasonable requirements of the buying public in the matter of speed of cars. An official observer will travel on each vehicle.

System of Marking for Reliability.—A maximum number of marks will be allowed for the run, and as usual 1 mark will be deducted per minute during which the vehicle is at rest, except for tyre troubles, compulsory and traffic stops, and stops authorised under the rules for accidental detours, lighting lamps, &c. In addition, 1 mark will be deducted for every minute in excess of the maximum time allowed for any stage, and 1 mark per minute for finishing any stage in advance of the minimum time. Up to a maximum of 1 hour, in the aggregate, will be allowed during the trial for stops for tyre repairs or troubles ; excess time beyond this will be reckoned as involuntary stops, and 1 mark for each 5 minutes or part thereof, in excess of stops over 1 hour, will be deducted and will count against the car in its marking for reliability or medal awards, no vehicle with such stops exceeding 1 hour in all being eligible for a non-stop certificate. During such tyre trouble stops, no other adjustment or repair must be carried out, and engines must be kept running except under certain conditions.

Hill Climbs.—Times will be recorded on several hills, and the performances taken into consideration in the determination of the medal awards.

General Conditions.—Each vehicle must carry its full complement of passengers or equivalent weight (11 st. per passenger) throughout, in addition to tools, luggage, fuel, oil, &c., but no passenger will be allowed to ride beyond the fixed seating capacity of each vehicle. Only recognised touring bodies may be fitted. Fuel and water tanks must be of the ordinary recognised size and capacity, as usually sold to the public, no extra fuel or water beyond that contained in the usual tanks, except the remainder of a tin of petrol partially used, may be carried. Arrangements for supplies of petrol, oil, &c., *en route* must be made by each entrant. The fuel consumption will be measured and stated in the certificates.

Entrants will be bound to sell for delivery within a reasonable time, similar motor cars and chassis to those entered, at the price stated, for three months after the date of the trial.

The chassis length has to be declared, and the chassis price is the base of classification, this price including tyres, and only tyres of the nature, make, and dimensions stated in the entry form may be used in the trial. Remarks as to the behaviour of the car during the trial, or as to parts which at the end of the trial show, in the opinion of the club, an undue amount of wear, may be added by the committee to the certificate.

Fifty minutes will be allowed daily for luncheon stops, of which 13 minutes will be allowed for replenishing fuel and lubricants. Twenty minutes for a like purpose will be allowed before re-starting from Edinburgh, Aberdeen and Pitlochrie. Any parts replaced must be notified in writing to the club. Sprockets must not be changed during the trial, and the driver or mechanic must not leave their seats to make any adjustment or repair while the car is running. Brakes may be tested at any time by the committee, and if in their opinion danger is involved to the occupants or the public, they may refuse to allow the car to continue in the trial. Five minutes per day will be allowed, without penalty, for the adjustment of brakes. Cars will re-start each day after luncheon in the order of their arrival ; the order of each morning's starting will be determined by the committee. On all occasions 2 minutes will be allowed to start the engine. The same driver must have charge and drive during the entire trial, except by consent of an official of the club. Any vehicle which may be pushed or assisted during the trial, including the hill climbs, or does not carry its full complement of passengers, will not be eligible for a non-stop certificate award.

Awards.—The club will award an efficiency gold medal in each class. The award of this medal in each class will be made to the car making the best performance on the following basis.

800 marks will be the maximum for reliability, subject to deductions for involuntary stops, for time in excess of maximum or short of minimum running time, for tyre stops in excess of one hour, for starting and stopping on hill tests.

100 marks will be allotted to the vehicle in each class making the best time in each hill-climbing test adopted, and the others will be allotted a percentage equivalent to their respective performances, and the average of the marks so gained will be taken, 100 being consequently the maximum possible.

100 marks will be allotted to the vehicle in each class showing the lowest fuel consumption per ton-mile over the whole trial, and the others will be allotted a percentage equivalent to their respective consumption per ton-mile.

The medal will be awarded to the vehicle in each class obtaining the highest aggregate marks.

The above is expressed in the following formula :—

$$\text{Marks gained for reliability} + \frac{\text{Total marks gained in hill climbing tests.}}{\text{Number of hill-climbing tests.}} + \frac{\text{Lowest petrol consumption per ton-mile in class} \times 100}{\text{Fuel consumption per ton-mile.}}$$

A special award or awards to any vehicle or vehicles competing in the Trial may be awarded by the club in their own discretion if its performance or other consideration warrants it. In addition a silver cup, to be called the "Scottish Cup," will be awarded to the vehicle (excluding steam cars) which shows the lowest fuel consumption per ton-mile over the whole trial.

Starts will be made each morning between 6 and 8 a.m. A vehicle not in place to start within 30 mins. of the specified time will be disqualified. Stopping and starting tests may be enforced by the committee on any hill or other part of the route, and marks deducted in the event of failure to restart within 30 secs.

Applications for forms and entries should be made to the Hon. Secretary, Mr. Robert J. Smith, C.A., 59, St. Vincent Street, Glasgow, not later than May 2nd, after which entries will be formally accepted. For 21 days thereafter double entrance fees may possibly be charged.

The Tyre, Speedometer and Lamp Trials.

FOLLOWING the preliminary weighing, marking and testing of the tyres, vehicles and instruments, the Dennis, Daimler and Rolls-Royce touring cars, with their Collier tyres, started off for the initial run on Thursday morning. The Crossley-Leyland 'bus, with "Hartridge" solid tyres, joins the trial later.

Clifford Earp's Remarkable 100 Miles Napier Record.

OUR readers will call to mind the account which we gave at the time of Mr. Clifford Earp's wonderful performances with a 6-cylinder Napier car on the Ormond-Daytona Beach, and how he overcame tyre and wheel troubles (we say both advisedly) which might well have knocked an average driver out of time and lost the race. Mr. Earp reached Liverpool by the "Baltic" last Friday night, and was good enough to give us a look in, immediately upon his arrival in London, as we were naturally enough anxious to hear the ins and outs of the story. Mr. Earp confirms definitely the accuracy of the principal times we were able to give at the date of the race. He particularly mentions the extraordinary performance of covering 9 miles in exactly 5 minutes, or maintaining a speed for that period, of exactly 108 miles an hour.

But it was about the lost tyre, and the broken wheel, and the fact that in spite of the lost tyre and the damaged wheel—six spokes broken on one side and eight on the other—with which he was able to finish and win the race, that we were naturally most athirst for information. When 34 miles of the distance had been covered, the Palmer tyre on the right rear wheel, which had not been tested for pressure before the race, and had been left without any special attention or examination for some days past, gradually went down for no apparent cause, all the tyres otherwise being in perfect condition. The car had to be drawn out of the course in accordance with the Florida Beach rules, and it proved no easy job to get the offending tyre off. They are not the sort of tyre to drop off when merely deflated, convenient as that might be under certain circumstances. At length the task was accomplished, however, and Earp, with 14 minutes lost through his stop, attempted to re-start his car in spite of the tremendous lurch that it suffered from the 4-inch tyre being removed from the right rear wheel, the rims bedding into the sand and bringing that side of the vehicle a good six inches lower than the other. However, the engine was started up and the power successfully transmitted to both the driving wheels, but, alas, the tyreless one span round in the sand. Then Earp started as slowly as possible, and in conjunction with Bater, his mechanician, shoved behind, and when the car began to move then the sand splutter ceased, it gradually gripped, and Earp, having regained his seat a few moments after, Bater was able to jump on at the back just in time not to be left behind. From that moment no further check was experienced. The car not only gripped and ran as well without a tyre on its rear wheel as did the other competitors, but gradually gained and gained and gained on the other competing cars till it won the race.

Vanderbilt Cup Race.

THE French Club having declined to run this race in France this year, arrangements are to be made for the contest to again take place in America. No locality has yet been settled, although there are, it is reported, several where the selection would be welcomed. The organisers will take time to think it over, and in the meantime it is understood, semi-officially, through Mr. Morrel, of the A.A.A., that "any place in the country that has aspirations in this direction may make its attractions known." Nassau County, Long Island, authorities are desirous that the race should again take place in their district.

Nice Week.

TOURIST cars over 1,000 kilogs. in weight are to be allowed to take part in the speed trials over the mile and kilometre.

Voiturettes and Tri-Car Trial.

ORGANISED in Paris by *Les Sports*, a contest for these small vehicles was concluded on Sunday last. In all, three voiturettes and six tri-cars "weighed in," three only of the latter finishing. The first place in the voiturettes class was secured by a Gregoire car, the tri-car section prize falling to a Griffon machine. The trial consisted of six daily journeys, starting each day from Paris, making a total of 1,200 kiloms. The results are given in the table below :—

Class I.—Tri-cars.

Cylinders, 500 *cmc.* *Minimum weight passengers*, 140 *kilogs.*

	Machine.	Driver.	Bore and Stroke.	Cylinders.	Marks Lost.
			mm.		
1	Griffon ...	Bucquet ...	82 × 90	475·20	787
2	Bruneau ...	Foulon ...	74 × 76	326·85	1298
3	Austral II. ...	Guitard ...	80 × 90	452·34	1414

Class II.—Voiturettes.

Cylinders, 700 *to* 1,250 *cmc.*

1	Gregoire I. ...	C. de Bosch ...	80 × 110	1105·80	233
2	Vulpes ...	Barriaux ...	100 × 120	942·46	457
3	Gregoire II. ...	Cornil ...	80 × 110	1105·80	1576

* * *

AERONAUTICS.

A Prize for Model Flying Machines.

As long ago as October last, Major Baden-Powell offered a prize for flying machine models of the heavier-than-air type. The value of the prize was to be £10, and the competition for it was to take place at the summer meeting in July of the Aeronautical Society of Great Britain at Sunningdale. The main conditions governing the competition are as follow :—

1. The apparatus may be of any form, but shall not weigh, all complete, more than one pound.
2. No gas or hot air for buoyancy shall be used.
3. Any propelling force such as compressed air, petrol, spirits, &c., may be employed (although it is probable that indiarubber springs will alone be found practicable in so small a machine), but no springs, explosives, or other agencies apart from those carried by the machine and included in its weight shall be used to give an initial impulse.
4. The apparatus shall be started from the ground or from a table or releasing gear not more than six feet above the ground.
5. The apparatus shall fly through the air for a distance of at least 100 feet, so that the distance from the ground from place of starting to place of falling shall be when measured in a straight line, not less than 100 feet. It must accomplish this distance twice over (with a short interval between) in opposite directions.
6. The prize will be given to the competitor whose machine covers the greatest distance.
7. The prize will not be awarded unless there are three or more genuine competitors.
8. Each competitor shall be held responsible for any damage or accident that may occur to or by means of his apparatus.
9. The competition shall be open to all of any nationality, who shall be approved by the Council of the Aeronautical Society of Great Britain.
10. Members of the Aeronautical Society of Great Britain shall have to pay no entrance fee, but to non-members there shall be an entrance fee of five shillings for those who are entered before the end of 1905, and half a guinea for those who are entered between January 1st and April 30th, 1906, the latter being the last day for receiving entries.

11. The award of the prize shall be decided by a jury of at least three members, to be appointed by the Council of the Aeronautical Society of Great Britain, who shall decide all points of doubt, and use their discretion as to the disqualification of any apparatus which they may consider not to comply with the original purpose of the competition, or one which they consider in any way dangerous.

12. The decisions of the jury shall be accepted as final.

The Barlatier–Blanc Aeroplane.

A NEW aeroplane of the superposed wing type has been built by M. Paul Barlatier, of the Automobile Club of Marseilles, and M. Blanc, of the Automobile Federation of the South West. The Barlatier-Blanc airship is well stayed together, but its planes are rather excessively curved or bent, and so far it has not, as we gather, been successfully navigated.

Cross-Channel Ballooning.

WE descanted last week on the splendid effects on the health produced by even ordinary ballooning voyages, and an example of this contention is provided by the recent experiences of Mr. Frank Butler, Mrs. Griffith Brewar, and Mr. Percival Spencer, who set forth from the Putney Gas Works at 2.15 p.m., and after a magnificent passage alighted at Haversant, some twenty miles south of Boulogne. While in full career above the Channel, the intrepid aeronauts consumed an indigestible meal of champagne, cake and sausage roll, a clear proof that the sport of ballooning brings the internal organs into a state of fine temper that absolutely nothing can upset.

Some Incidents of the Flight.

NOT long after leaving the English coast, the aeronauts heard an unusual buzzing noise coming up from far beneath, apparently from the Channel, which seemed to their enlarged vision little wider than a canal, so clear was the atmosphere and so high up were they. They could see nothing, however, owing to a passing cloud, till at length they observed one of the new turbine steamers, which was ploughing along at a great pace, and had a decided start of the balloon. The wind, however, was blowing fairly strongly, and in spite of the handicap the balloon beat the turbine steamer easily, and arrived at the French coast well before it. Indeed, the performance is a remarkable one for a balloon journey, as the travellers were back in London some fifteen hours after leaving the gas works.

A Correction.

ALL aeronauts will be glad to learn that M. E. Archdeacon, to whose sudden and unexpected death we referred last week, was not, as a matter of fact, the celebrated experimenter and encourager of aeronautic research who has been so generous a patron of the art.

* *

Steam Cars in Competition with Petrol Cars.

IT must be distinctly encouraging to the advocates of steam pleasure vehicles that a steam car should have succeeded, on the score of fuel consumption, in winning the touring-car prize in an endurance trial in America recently. The result of this event—the Los Angeles-San Diego run, in which a White steam car obtained the first prize in the heavy class—was recorded in THE AUTOMOTOR JOURNAL of February 17th, but we now have further particulars concerning this remarkably successful performace. During the two days' run, over a distance of 180 miles, there were four controls each day, stoppages being made mid-morning, noon, mid-afternoon, and at night, while the main system of marking was to deduct one mark for every minute of delay on the road, or of work in the garage, from the 1,000 marks with which each car was credited at the start. To avoid any possibility of two cars tieing for the first place, it was further arranged that in such an event the amount of fuel used should first be considered, that failing this the quantity of lubricating oil used should be taken into account, and that if by any chance the performances were still equal, the car keeping nearest to schedule time should be the winner. In the result the White steam car, driven by Mr. C. A. Hawkins, and also a 4-cylinder Packard car (petrol) succeeded in completing the run without the loss of a single mark. The White steam car, however, only used 17 gallons (American) of fuel, as against 21 gallons consumed by the Packard, and consequently secured the prize, as well as the special J. B. Spreckle Cup offered for lowest fuel consumption. In view of the mountainous nature of the country, and the roughness of the roads, it was a remarkable performance, and cannot but raise the hopes of all those who hope to see steam cars successfully holding their own with petrol cars, even in races based upon the lines of the Tourist Trophy—a type of competition in which it is by no means derogatory to the good all-round capabilities of steam cars that they cannot at present compete on equal terms with petrol vehicles.

Mr. Harvey du Cros, M.P., J.P.

A VERY pleasant surprise was sprung upon Mr. Harvey du Cros at Regent Street, last week, when he was unexpectedly invited to receive an address from his staff and the employees of his various motor businesses upon the occasion of his return to Parliament. Mr. du Cros, who was accompanied by Mrs. du Cros, was particularly gratified at this spontaneous show of appreciation by those associated with him. Among those who spoke on behalf of their respective departments, congratulating Mr. du Cros on the splendid victory which he achieved at Hastings, were Mr. Reginald Chanter, representing the Panhard and Levassor staff and employees; Mr. W. A. Turpin, manager of the works at Kimberley Road, Kilburn; Mr. E. H. Lancaster, for the Clement Company; and Mr. A. McCormack, for the Gladiator Company. The formal address was presented by Mr. Reginald Chanter.

Mr. Harvey du Cros, M.P., in responding, was evidently very deeply touched, and he said that although he had been speaking a good deal for the last two years, it was to very different gatherings than to that at which he was then present. This one was more intimate and personal. He was extremely glad he had won at Hastings, but he was prepared to confess that when he began that fight he had no idea it was the sort of thing it turned out to be, and when it was over he was so tired that he did not know whether he was glad or sorry. Since then he had been away and had had a little rest. The meeting which he was now attending had turned the scale, and he now knew that he was glad, and he was not in the slightest doubt as to his feelings with regard to his election at Hastings under the circumstances. He thanked them very heartily for the remarkable assistance which they one and all had given to him in his fight, and he concluded by saying that nothing could have pleased him more than to have received an address in the form in which it was presented, where all of the names of those associated with him were entered. It was a thing he would be very proud of, for all time, the more so as the whole affair was entirely unexpected.

The Menu Card at Mr. S. F. Edge's Dinner last Saturday. The design represents the development of the motor trade. In the top left-hand corner, Mr. Gordon-Bennett is seen writing his offer of the now famous Gordon-Bennett Cup to the French Club, this act being supposed to have started the popularity of motoring, which was fostered and developed by the Press, as depicted in the right centre picture, resulting in the construction of huge factories, shown in the bottom right picture, all of which however, as Mr. Edge pointed out, were dependent upon the signer of cheques hinted at in the bottom left corner.

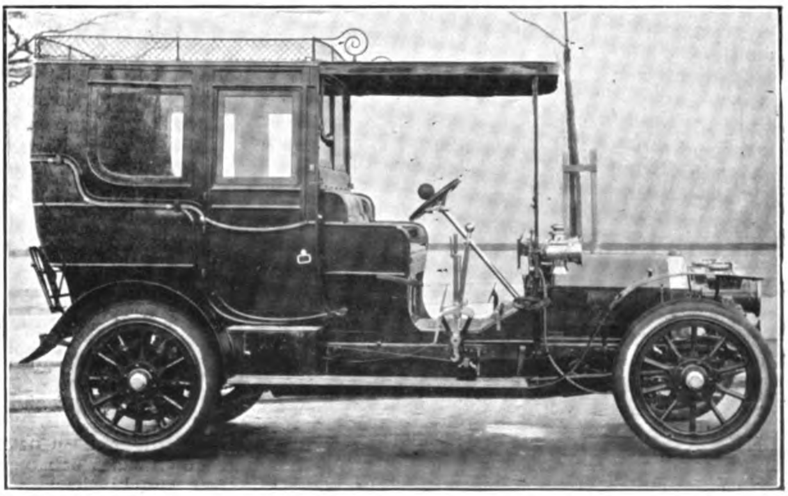
Mr. S. F. Edge gives 3 years' Guarantee.

In years to come, February 24th, 1906, will be memorable in the automobile world as the date upon which a British firm led the world in giving a three years' guarantee with each motor car purchased. The firm is Messrs. S. F. Edge, Limited, and the car, the Napier. This announcement was the main object of a very enjoyable little dinner to which Mr. S. F. Edge invited his many friends of the Press and others on the date above mentioned. To look back but a comparatively short number of years, and remember the almost hourly mishaps that occurred to the majority of cars, it almost seems impossible that such progress could have been made as to justify such an important and bold departure. Some French manufacturers, who heard of Mr. Edge's new scheme, point blank declared to him that to their minds it would mean bankruptcy, and that French firms would surely not follow the lead. Mr. Edge, nothing discouraged, has replied by his public announcement. It remains to be seen how far competing firms can afford to remain outside giving a similar undertaking. Another historical point made at Mr. Edge's gathering was his calculation that for the first time the value of British motor cars manufactured during January, 1906, amounting to £468,000, exceeded the foreign imports of £317,000 for the same month—a result of which the British industry have good reason to be proud. Moreover, Mr. Edge estimated that the total value of cars which 1906 would see manufactured in Great Britain would probably reach £6,000,000 sterling.

One note of regret was apparent at the dinner—the absence of Mr. Napier, the man who has built the now world-famous car known under his name—and the regret was the keener through illness, requiring a lengthened change of scene, being the cause. Even Mr. Napier would, however, have felt satisfied with the reception, in his absence, of the toast of his health, following a *résumé*, by the host of the evening, of the remarkable part which Mr. Napier had played in the development of the motor industry, both on land and sea, from 1899 up to the present year, 1906, resulting in a change from a dozen men making *a* Napier car in the former year to a wage list alone of £300 per day at the present time. That Napier cars are now being made in America and Italy we already knew, and on the same evening we learned that Russia had come forward and proposed establishing a factory to construct cars to Napier designs.

Mr. Edge, in urging British makers to press forward in establishing Great Britain as the head of the world's motor industry, said that racing on land and sea was an essential to further developments—twelve hours' racing experience, he believed, taught more than three months' ordinary running. The introduction of the 6-cylinder principle, he maintained, would lead to the reduction of the expenses of motoring, and he was glad to note that this was so much appreciated that there were already thirty-five makers copying this principle, the latest being the Mercedes.

Besides "The King" the only formal toast was that of "The Host," very aptly proposed by Mr. Claude Johnson, who was able to fill in many blanks in the history of the development of the British motor industry which Mr. Edge in his modesty had omitted to credit himself with—including the introduction commercially of the 6-cylinder car.



One of the new 1906 model 20–25-h.p. Brotherhood cars. This identical carriage has been acquired by the Rt. Hon. Earl of Mar and Kellie.

"Pioneer" Motor 'Bus Service.

THE London Power Omnibus Company opened last week their new garage at Cricklewood. It is 250 ft. by 80 ft., and is stated to be the largest in the world, accommodation for 150 double-decked omnibuses being provided. The buildings and yards are lit by electricity throughout. In addition to two spacious yards there is a large repairing shop, and ample office accommodation. The whole establishment covers about 1½ acres. The method of the storage of petrol is underground in two huge tanks, each with a capacity of 3,000 gallons. The petrol is then pumped into a cistern above ground, from which it is conveyed, to the 'buses through pipes, also underground, to "traps" (as shown in our photograph). There are 12 of these "traps," so that 12 'buses can be charged at one time. A novel feature on these "Pioneer" 'buses is the broad projecting front rubber "buffer," which is intended to break the force of a collision, and protect the radiator. We reproduce this week some interesting photographs of the "Pioneer" establishment.

THE "PIONEER" MOTOR OMNIBUS GARAGE.—**General view of the large building in which standing room is provided for 150 double-decked omnibuses.**

Honouring Automobilism.

M. L. MORS has received the Cross of the Legion of Honour.

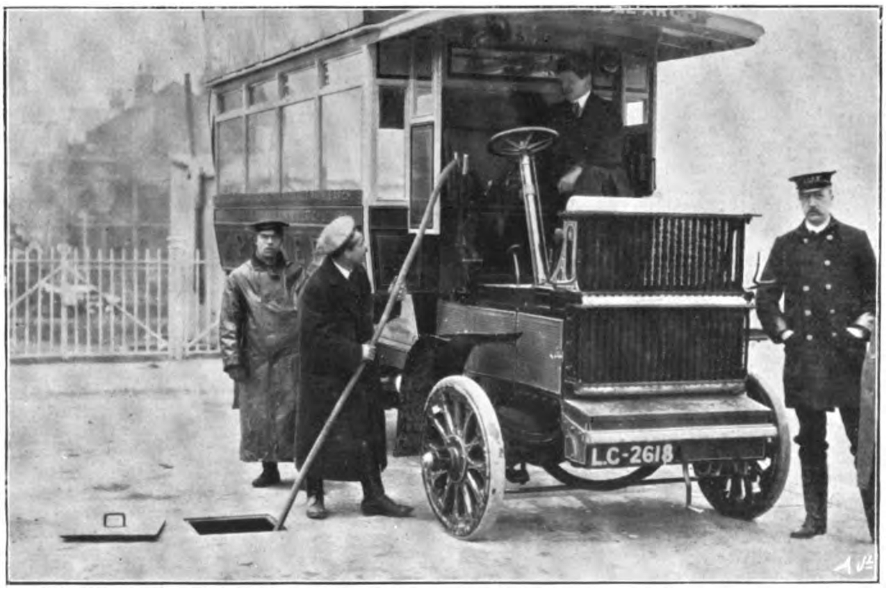
A Warning Example.

ONE of the persistent bicyclists who make a practice of riding behind motor cars as close as they can, and sometimes even running into them, has had a salutary lesson. This particular sample of recklessness was riding behind Lady Warwick's motor car when it was being driven home by her chauffeur. He collided with the car, probably owing to an unexpected slackening of speed, and injured his machine, after which he had the impertinence to bring an action for damage against both Lady Warwick and her chauffeur jointly. Needless to say he was not awarded a penny.

"An Elastic System of Control."

AT the last meeting of the Surrey County Council Mr. H. H. Gordon Clarke moved the adoption of a resolution:—

> "That this Council is of opinion that the next Act to regulate motor traffic should confer such powers on one of the State Departments as would provide an elastic system of control without the necessity of frequent recourse to Parliament."



THE "PIONEER" MOTOR OMNIBUS GARAGE.—**Filling up a petrol tank on an omnibus. By similar means the tanks of twelve omnibuses can be filled at the same time from various "traps," drawing off their supply through a high-level cistern in connection with the main supply contained in two huge underground tanks.**

Encouraging "Home Industries."

THE Emperor of Germany has now three 70-h.p. Mercedes cars. His latest acquisition is a 1906 model of 45 h.p.

A Big Blaze.

A FIRE at motor car and repair shops at Moncton, near Ottawa, is reported, whereby damage amounting to £300,000 has been done. A valuable car belonging to Earl Grey was amongst the property destroyed.

Fee for Climbing the "Radical Road"—3 Guineas.

As a sequel to the feat of climbing the Salisbury Craggs in Edinburgh, by way of the "Radical Road," Mr. Charles Jarrott was mulcted in three guineas at the Edinburgh Burgh Police Court last week, the official seal being thus set upon this performance.

CLUBS AND ASSOCIATIONS.

THE MOTOR FACE
Tom Browne
Keep on his right side
Tom Browne
ONE WHO DOES NOT LIKE MOTOR CARS
Tom Browne

Original Humorous Sketches by Tom Browne, R.I., at the Dinner of the Blackheath Automobile Club.

Blackheath A.C.

THE annual general meeting and dinner was held at the Art Club, Blackheath, on Friday of last week, Col. Holden, R.A., in the chair, when fifty members and guests were present. Amongst the routine business of the annual general meeting the annual report and balance sheet was accepted and passed, and the following officers elected :—

President: Lord Hugh Cecil.

Vice-Presidents: Col. H. C. L. Holden, R.A., F.R.S. ; Prof. Carlton J. Lambert, M.A. ; Hon. Arthur Stanley, M.P.

Committee: Messrs. H. Cunis, J. Strickland Goodall, M.B., Arthur Jackson, E. W. Stabb-Johnson, Ralph Lucas, T. Marshall, J. T. Prestige, jun., Fred Thorne.

Hon. Treasurer: Mr. H. J. Fisher. *Captain:* Mr. Leonard Beadle. *Hon. Sec.* : Mr. Alfred Roberts.

Following the business a musical programme was much enjoyed. Dr. Goodall, the poet laureate of the club, recited some verses he had ably composed, describing the various peculiarities of the officers of the club, which proved most amusing.

The *bon bouche* of the evening was the lightning sketches which Mr. Tom Browne, R.I. (member of the club), kindly made, and which, by permission, we reproduce, depicting the features of "the man who does not like motor cars," "keep on his right side" (head of a constable), and "the motor face," which were extremely clever character studies, and their rapid delineation causing great interest to the onlookers.

Ladies' A.C.

AT the invitation of the Countess of Amherst, members of the L.A.C. will meet at Montreal, Sevenoaks, on March 17th.

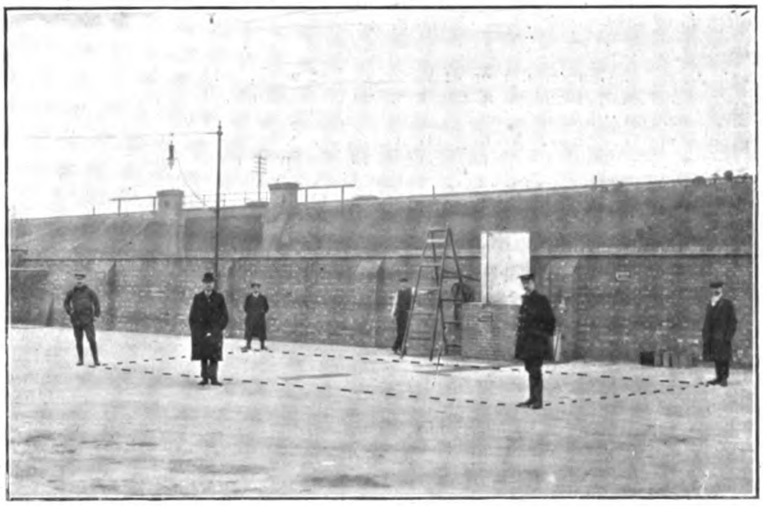
Mrs. Edward Manville must have felt particularly gratified at the huge gathering of members and friends at the club last week, upon the occasion of her reading a paper, "A Try for the Herkomer Trophy," which is reproduced elsewhere in THE AUTOMOTOR JOURNAL this week. It proved of great interest, and Professor Herkomer, who was present, personally complimented Mrs. Manville upon the very interesting *résumé* of her experiences. Lady Cecil Montagu presided, and amongst those present were Princess de Polignac, Lady Edward Spencer Churchill, Lady Margaret Jenkins, Lady Geraldine St. Lawrence, Lady Maud Parry, Lady Beatrice Rawson, the Countess of Kinnoull, Baron and Baroness Campbell Von Laurentz, Mrs. Von Herkomer, and Miss K. d'Esterre-Hughes.

Motor Union.

THE general committee of the Motor Union, at its February monthly meeting, added the following distinguished members to its list of vice-presidents :—His Grace the Duke of Beaufort, J.P., D.L., the Right Hon. Earl Cairns, the Right Hon. Lord Wenlock, K.C.B., the Right Hon. Lord Llangattock, J.P., D.L., Sir Charles Seely, Bart., J.P., Sir George Livesey, M.I.C.E., and Mr. N. Micklem, K.C., M.P.

Considerable additions to the membership of the Union were reported, bringing the total number of clubs included in the Union up to 64, and its aggregate membership to upwards of 10,800.

The annual meeting of the Motor Union will be held on Wednesday, March 28th, at the Agricultural Hall. It has also been arranged that members of the Union shall be admitted free of charge to the Motor Car Exhibition (which will then be in progress) on the above date, and also on the opening day of the Exhibition, namely, Saturday, March 24th.



THE "PIONEER" MOTOR OMNIBUS GARAGE.—The storage of petrol for use by the omnibuses is in two enormous underground tanks at the Cricklewood Garage. The size of the tanks may be judged from our photograph, the dotted lines, with a man at each corner, showing the square space occupied by one of them. In the background of the photograph will be noticed the special high-level cistern to which a force-pump is attached, from which the supply to the several "traps" is conveyed for filling up the tanks of the omnibuses as required, for daily service.

The Hon. H. L. Bruce, accompanied by Mr. Colin Defries, in his 40-h.p. De Dietrich car. Mr. Bruce has been driving a considerable distance through England, having in the last twelve days covered about 1,400 miles, our photograph being taken by Mr. Hazel, of Bournemouth, during Mr. Bruce's recent journeyings.

CLUBS AND ASSOCIATIONS—*continued.*

British Motor Boat Club.

The club, we are informed, is now appointing at various ports on the coast, and in various districts on the Thames and other rivers and estuaries, official repairers and water garages. In doing this, the aim is to endeavour to get a uniform and reduced scale of charges for members of the club. The same system is also being carried out with regard to hotels at the various seaports and on the Thames.

The opening meeting of the club will be held on May 5th on the Thames.

At the Agricultural Hall Motor Show, a reception of the club will be held on Friday, March 30th, in the Reception Hall placed at the disposal of the club by Messrs. Cordingley.

Burnley A.C.

AFTER the annual dinner of the club last week, held at the Empress Hotel, Burnley, a paper was given by Mr. Douglas Mackenzie on "Transmission in Motor Cars," illustrated by photographs and diagrams. During the course of the evening the secretary, Mr. Smith Lawson, announced the receipt of a communication from the North-East Lancs. Automobile Club, suggesting the advisibility of an amalgamation of the two clubs. It was, after some little discussion, decided to call a general meeting of the members to decide the question.

Society of Motor Manufacturers and Traders, Ltd.

THE increasing membership and the extension of the interests of the Society of Motor Manufacturers and Traders have from time to time caused the formation of separate sections, such as the commercial vehicle, the marine motor, and the tyre and accessories sections. It has been decided to add yet a fourth, for carriage builders. Amongst the members of the society there are many of of the best known carriage builders, whose interests in connection with the motor trade have now become very considerable, and who are represented at the Society's Exhibitions at Olympia by samples of carriage work generally of the very highest character.

The Automobile and Cycle Engineers' Institute.

THE adjourned meeting of the London Section for the discussion on Colonel Crompton's paper, "Some Unsolved Problems in Motor Engineering," will take place on Wednesday next, the 7th of March, at the Royal United Service Institution, Whitehall, London, at 7.30 p.m. prompt.

All those who intend to take part in the discussion are requested to lodge their names with the secretary at least three days before.

COMPANY DOINGS.

A. Darracq and Co. (1905) Limited.

AT the statutory meeting of the company, held last week, at which Mr. J. Sydney Smith-Winby, the chairman of the company, presided, the prospects of the company were dealt with by the chairman, and appeared to be of the most promising character. Since October 1st, when the new company took over the business, the progress had been thoroughly well maintained, and a great rush of business had been going on the whole time. In dealing with the question of heavy traction, Mr. Smith-Winby mentioned that apparently every day almost saw the birth of a new motor omnibus company. They had been very much pressed to undertake the manufacture of these vehicles, but had been compelled to decline the offer of orders that had been made them, for the reason that Mr. Darracq, who had carefully studied the whole subject for some time, was very distinctly of the opinion that a really practical and efficient type of motor omnibus had yet to be evolved. Mr. Darracq was still engaged upon this question very carefully, and later on he hoped to have an interesting announcement to make upon the subject. The chairman also mentioned the establishment of a branch factory in Italy in the neighbourhood of Naples, which would be an Italian company of very considerable importance and value to their company. This factory, they hoped, would be in full operation within six or seven months.

A very cordial vote of thanks to the chairman and directors was passed for the admirable way in which the business of the company had been conducted, and the proceedings terminated with a general feeling of satisfaction amongst the shareholders.

London and South Coast Motor Service, Ltd.

SOME interesting particulars were given at the statutory meeting of this Company held last week, when Mr. Carlton Roberts, Chairman of the Company, presided. Mr. Roberts stated that the business which they had acquired of Mr. J. W. Cann, of Folkestone, was taken over by them on December 15th last. The receipts since then had worked out at a fraction over 5*d.*, and the running expenses at a fraction over 2¾*d.* per mile run, these figures representing the receipts at their lowest for December, January, and February. During the summer season their cars, he stated, running with a full complement of passengers, earned on an average 1*s.* 2½*d.* per mile, while the expenses did not exeeed 4½*d.* He then drew attention to certain patents of the Company's, one of which had passed, he said, the experimental stage, having enabled them to run 8,600 miles with tyres which were ordinarily expected, though not guaranteed, to run 4,000 miles, bringing the ascertained actual cost of their tyres to ¾*d.* per mile run, in comparison with what he understood the estimate for the cost of tyres, supplied to motor omnibuses under the most favourable conditions, to be at 2½*d.* per mile. Theirs was not estimate but actual experience. The directors had also taken out a patent for twin tyres and had also patent rights in improvements for mechanism for driving, braking and spragging motor cars, all of which they thought would be of great utility and in considerable request by other companies.

Their special motor coach was also of registered design to hold 20 persons, and was not an ordinary omnibus. It was under the 3-ton limit, and could therefore be run up to 20 miles an hour, whereas the omnibuses and other vehicles over that weight were limited to 12 miles. It was entirely of British manufacture, the engine being a specially designed 6-cylinder type, of 50 h.p., built by a well-known and leading engineering firm. These engines were of the slow-running order, whereby vibration and noise were greatly minimised. The wood used in the construction of their car was fire-resisting. Their first new coach would be delivered, they were promised, in time to be exhibited at the Motor Show at the Agricultural Hall in March.

In reply to questions, the chairman stated that although only 4,608 shares had been taken up out of an expected 13,000, this would not interfere with the company's programme, and that they were in a position to put from ten to twelve of their coaches on the road, having already eight on order. There was quite a possibility of their getting thirty running, in spite of the capital not having been fully subscribed.

THE Enfield Cycle Company, Limited, propose forming a separate company under the title of the Enfield Autocar Company, Limited, for handling the motor section of the business. The new company are to acquire the works at Hunt End.

THE fire which occurred at the Rover Works last Saturday, we are informed, was not of a very serious character. It is likely, however, to affect the prompt delivery of cars promised for this and next month. The fire has, for the time being, disorganised the material stores, and until the disorganisation is remedied, the Rover Company, Limited, seek the indulgence of their many clients.

COMMERCIAL POINTS.

Recreation for Motor Car Workers.

LARGE industrial companies having factories situated in the country usually set aside a special mess-room for the use of their employees at meal times. At the Crayford (Kent) Works of the Wolseley Tool and Motor Car Company, Limited, this idea has, by the energy of Mr. L. Silverman, works manager, been extended so that the opportunities which the possession of such a room affords for social evenings are taken full advantage of. The whole of the necessary fittings and furniture, we learn, have been purchased with the proceeds from the small nominal charges made for attendance and cooking the staff dinners, at the same time leaving a good balance at the bank sufficient to meet all expenses in the organisation of any special functions. The hall, which is now excellently furnished, is the headquarters of a gymnasium and sports club, while a works orchestra provides musical selections at the dances and social evenings which are a regular feature of the winter programme.

Mr. J. D. Siddeley, General Manager of the Wolseley Company, occupied the chair at a smoking concert given at the works when the gymnasium competition awards were presented. In calling attention to the great amount of good which systematic physical training does for young men, Mr. Siddeley announced his intention to present a challenge trophy for competition next season, and trusted that the *entente cordiale* between the Crayford Works and the Birmingham Works would show itself in the institution of inter-works competitions at sports meetings.

More Steam Commercial Vehicles.

EXTENSIONS are just being completed to the works of Turner's Motor Manufacturing Company in Wolverhampton for turning out commercial vehicles in addition to the Turner-Miesse pleasure cars. These new vehicles, the first of which are intended for 30-cwt. loads or for public service work, carrying 16 to 20 passengers, are designed on similar general lines to the present touring cars—that is to say, they are fitted with "flash" steam generators and engines having three single-acting cylinders. A new type of paraffin burner and a new form of boiler are being introduced. We learn that the successful running of the first of these vehicles has already led to the placing of several orders from different parts of the world—including Japan and Porto Rico.

Motor Chains by the Mile.

SOMETHING like a record order for chains has been given out by the Daimler Motor Company, the quantity being 25,000 ft. of 1¼ in. pitch. This contract has, we learn, gone to the Coventry Chain Company, who for the past two years have supplied all the chains required by the Daimler Company, which has justified the company in placing the present important order. This large order would show that a very largely increased output of motor cars is anticipated, and that Coventry manufacturers mean to take their share of the trade. The Coventry Chain Company are naturally gratified at the placing of this order with them, and are making effective use of the letter giving the order by having photographic fac-similes made and distributed.

HIS MAJESTY KING EDWARD, who is progressive in regard to everything with which he is associated, has recently had one of the well-tried "Castle" trembler coils, for 4 cylinders, fitted to one of his cars.

WE have recently had an opportunity of giving a good practical trial to the special lubricating oil which is supplied by Messrs. De Dion-Bouton, Limited. As already pointed out in the columns of this Journal, the De Dion-Bouton oil is a special lubricant, the preparation of which has resulted from careful tests conducted in these celebrated manufacturers' own works over a considerable period. From our own experience we can say that it fully comes up to the claims made for it, and that those requiring a thoroughly good oil for their petrol cars—for engine and for gearing—can rely upon that supplied by the De Dion-Bouton Company.

MESSRS. W. AND G. DU CROS, who recently opened premises at South King Street, Dublin, have secured the special appointment to the Lord Lieutenant of Ireland.

THE Continental Tyre and Rubber Company have brought out a motor tyre accessory box suitable for private garages and motor car owners, containing repair material necessary in connection with the upkeep of motor tyres; also repair outfits in different sizes, puttees, tyre levers, &c.

THE LIVERPOOL MOTOR HOUSE, LTD., of 6, Atherton Street, South Castle Street, Liverpool, have opened a garage establishment at the above address. The Company are the sole district agents for the Arrol-Johnston cars.

SIR OSWALD MOSLEY, BART., D.L., J.P., the well-known breeder of shorthorns, who is already the owner of a Ryknield and a 6-cylinder Napier, has just ordered from Messrs. C. S. Rolls and Co. a 6-cylinder Rolls-Royce car.

AT the Newcastle Motor Show there were 132 Dunlop tyres fitted.

SEYMOURS, LIMITED, of Knightsbridge, S.W., inform us that owing to the increase in their business they have taken adjoining premises at No. 18, Brompton Road, comprising three floors. They have also decided to open a school of motoring.

THE Continental Tyre Company have received an order from the Daimler Motor Company for three sets of Continental tyres for use on Royal motor carriages.

MESSRS. FRANK LITTLE AND COMPANY, of Newcastle-on-Tyne, have opened a new garage for repairs at Moor Edge, Spital Tongues. The firm are also opening shortly a central motor depôt, showroom and offices at 19 and 21, Westgate Road.

* * * *

PUBLICATIONS RECEIVED.

Catalogues.

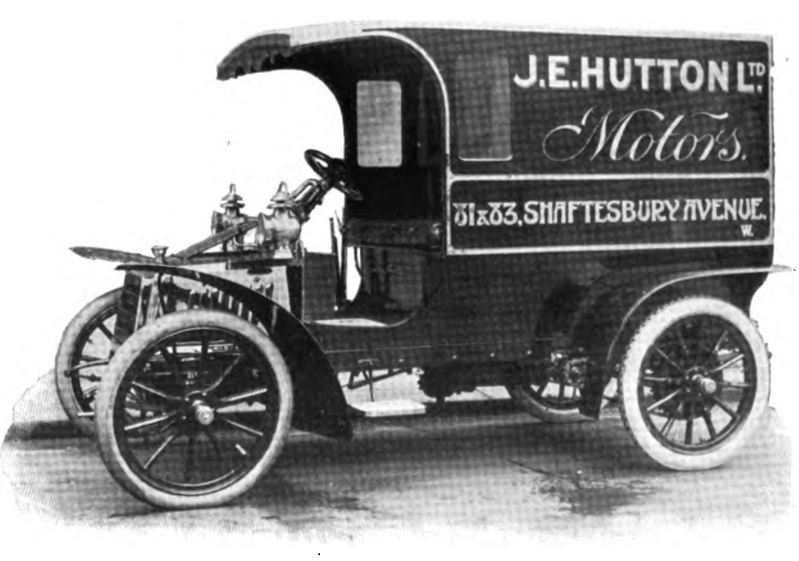
Ariel Cycles and Motor Cycles, 1906. The Ariel Cycle Co., Ltd., Bournbrook, Birmingham.

Maudslay Marine Motors, 1906. The Maudslay Motor Co., Ltd., Parkside, Coventry.

Maudslay Cars, 1906. The Maudslay Motor Co., Ltd., Parkside, Coventry.

Heavy Vehicles. The Maudslay Motor Co., Ltd., Parkside, Coventry.

Electric Ignition for Automobiles, 1906. Van Raden and Co., Ltd., Coventry.



A NEW MOTOR DELIVERY VAN.—A number of these vans have just been constructed for Messrs. J. E. Hutton, Ltd., with a capacity of 10 cwt. The chassis is by Panhard and Levassor, the engine being of the 3-cylinder 8-11-h.p. type. The vehicle is specially constructed for the purpose of a light delivery van and every detail has been studied with the object of minimising complication. A high average speed with full load can be maintained and it is estimated that by means of this van the work of three horse vans or twenty cycle carriers can be accomplished.

NEW COMPANIES REGISTERED.

Andrew King and Company (Limited), Victoria Garage, Shakespeare Street, Nottingham.—Capital, £5,000 in £1 shares. Object, to acquire the business of an engineer carried on by A. King, and to carry on the business of manufacturers, repairers, motors, cycles, vehicles, &c.

British Motor Omnibus Company (Limited).—Capital, £100 in £1 shares.

Cappellen and Freeman (Limited).—Capital, £100 in 1s. shares. Object, to carry on the business of dealers in motor chassis, motor cars, omnibuses, &c.

Deasy Motor Car Manufacturing Company (Limited).—Capital, £150,000 in £1 shares. Object, to carry on the business of motor car, omnibus, and vehicle manufacturers, and to acquire all or any of the shares in H. H. P. Deasy and Company, Limited. First directors, Captain H. H. P. Deasy, Sir Richard W. Griffith, Sir Robert W. Buchanan-Jardine, E. J. Brook, Major Edward de Grey Beaumont, and K. H. Buchanan.

J. T. Ireland and Company (Limited).—Capital, £500 in £1 shares. Object, to acquire the business of motor car and cycle manufacturers and repairers carried on by J. T. Ireland and Company, at Piper's Row, Wolverhampton.

Liverpool Motor House (Limited).—Capital, £500 in £1 shares.

London and Counties Motor Omnibus Company (Limited).—Capital, £100 in £1 shares.

London and Provincial Motor Dispatch Company (Limited), 128, Goswell Road, E.C.—Capital, £10,000 in £1 shares.

London Motor Parcel Express (Limited), 128, Goswell Road, E.C.—Capital, £10,000 in £1 shares. First directors, J. J. Paterson, H. R. Paterson, A. L. Paterson, J. Paterson, and J. E. Carter (all directors of Carter, Paterson and Company, Limited).

North-Eastern Garages (Limited), St. Nicholas Chambers, Side, Newcastle-on-Tyne.—Capital, £50,000 in £5 shares. Object, to acquire the businesses carried on at Harrogate and elsewhere by H. Johnson and Company, Limited, and at Darlington and elsewhere as Leather Brothers, automobile engineers, manufacturers, and dealers, &c. First directors, E. L. Green, H. G. Blackburn, K. J. W. Leather.

Provincial Motor 'Bus and Traction Company (Limited), 3, London Wall Buildings, E.C.—Capital, £305,000 in 300,000 ordinary shares of £1 each and 100,000 deferred shares of 1s. each. First directors, A. A. Campbell Swinton, E. W. Stanyforth, J.P., E. H. Bayley, J.P., and H. Greer.

* * *

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

9376. 4th May, 1905. An Improved Method of Igniting the Explosive Charge in Internal Combustion Engines. Thomas F. Robinson, 52, Market Place, Driffield, Yorks. The object of this invention is to render an engine of this type continuously self-igniting after it has been started, and to enable the continuous use of electrical or accessory means of ignition to be dispensed with. The invention consists briefly in igniting the explosive charge in each cylinder by its direct contact or combination with the flame or heated gases of combustion of a similar charge, which, in a multiple cylinder engine, has previously ignited to generate the working explosion in one other of the cylinders, the working cycle and consequent ignition of which is in advance of that of the cylinder containing the charge which is to be ignited. There are ten figures. Fig. 3 is a sectional plan. The cylinders and their respective pistons and cranks are marked 1, 2, 3, 4, 5, 6. The usual type of valves for the admission of the explosive charge, and the exhaust of the products of combustion, are indicated. 7 are the valve-chambers, connected with their respective cylinders by the passages, 8, the admission valves being marked 9 and the exhaust-valves 10. Ignition-ports 11, 12, 13, 14, 15, 16 connect each valve-chamber with a common ignition-passage 17. The ignition-valves which control the ignition-ports are marked 18, 19, 20, 21, 22, 23. The ignition-valves are controlled by the engine, and may be actuated in any suitable manner, such as by means of cams mounted on a shaft driven by the engine. To prevent loss of pressure from the common ignition-passage, 17, around the ignition-valve-spindles, the latter may work through stuffing-boxes as indicated at 24. The cylinder-valve chambers and common ignition-passage are shown surrounded by a common water-jacket, 25. An electrical sparking-plug, or a plug having a filament which can be rendered incandescent by the passage of a current of electricity, projects into the common passage, as shown at 26.—February 7th, 1906.

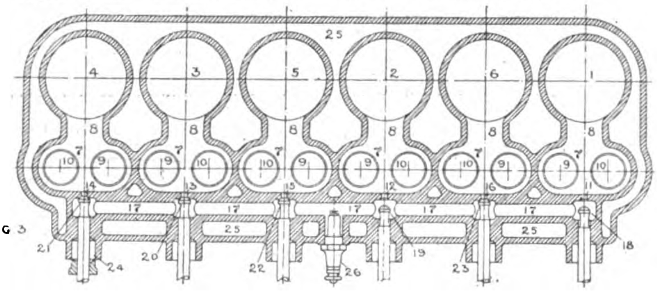
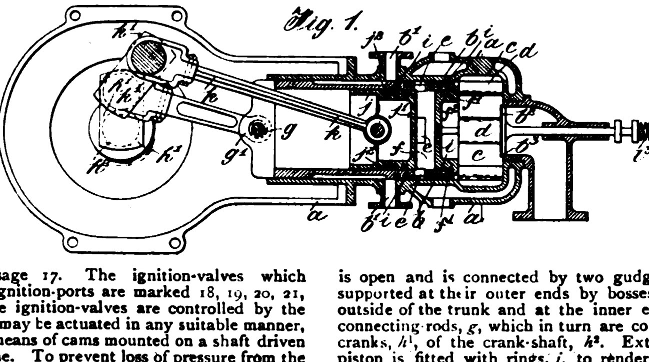


FIG 3

9466 5th May, 1905. Improvements in Two-stroke Internal Combustion Engines. Leethem Reynolds, 6, Westfield Park, Wakefield, Yorsk. This invention relates to improvements in two-stroke internal combustion engines, the object being to provide an improved arrangement of engine, whereby greater efficiency may be obtained, and also one in which the spent gases may be readily expelled from the combustion-chamber prior to the new charge entering therein. There are six figures. Fig. 1 represents a sectional elevation of an engine. A crank-casing, *a*, designed to enclose the main working parts of the engine, provided with a cylinder, *b*, is adapted to be cooled by water or air. The cylinder has a recessed crown, *c*, or combustion-chamber, the recesses, *d*, in which are parallel to the cylinder-axis, and are radially opposite to ports, *e*, in the piston, *f*, which has one end, f^1, closed at f^2. The other end is open and is connected by two gudgeon-pins, *g*, supported at their outer ends by bosses, g^1, on the outside of the trunk and at the inner ends by two connecting-rods, *g*, which in turn are coupled to the cranks, h^1, of the crank-shaft, h^2. Externally this piston is fitted with rings, *i*, to render it gastight against the interior of the combustion-cylinder. Within the outer piston is a trunk-piston, *j*, also with one end, j^1, closed and the opposite end open, which is referred to as the compressing-piston. Rings, j^2, or other suitable means are adapted to make this a working gastight fit in the interior of the driving-piston. Its open end is coupled to a connecting-rod, *k*, whose opposite end is in turn connected with a crank, k^1, on the crank-shaft, such crank having a throw greater than that of the cranks connected with the driving-piston. The compressing piston-crank is set at an angle to the cranks connected with the driving-piston. In the walls of the combustion-cylinder, *b*, is a port or ports, b^1, for the admission of gases, and at the opposite end of the cylinder to the crank-shaft is an exhaust-valve, b^2, of suitable design, adapted to bear against a seating, b^3, and mechanically controlled by a rocking-shaft, lever, and spring, l^3, on its spindle in connection with the crank-shaft, k^2. In the wall of the driving-piston, *f*, is the port or ports, *e*, for the admission and expulsion of the live gases corresponding to the ports in the combustion-chamber.—February 7th, 1906.



Patent Specifications Publishe1.

Applied for in 1905.

Published February 22nd, 1906.

17,680.	H. T. Hutton. Silencer.
18,643.	C. F. Smith. Reversing and speed-changing mechanism.
24,867.	Industrial Development Co. Ignition device.
25,779.	J. E. Hopkinson. Rims and elastic tyres

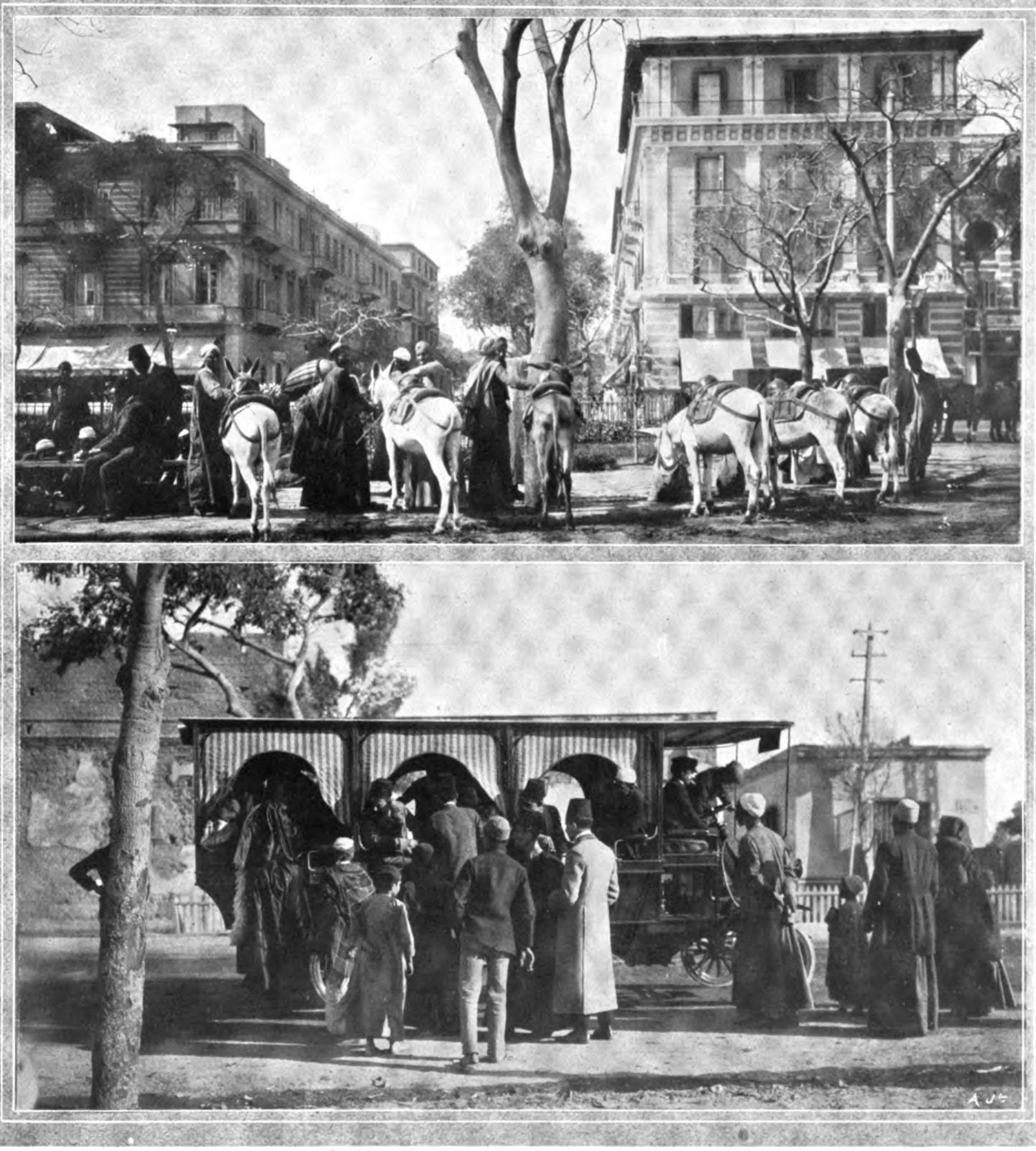
Published March 1st, 1906

227.	B. E. Scriven and W. C. Smith. Variable speed belt gearing.
2,255.	J. A. Swinehart. Elastic tyres.
2,492.	General Electric Co. Intl. combn. engines.
2,870.	W. B. Hartridge. Tyres and wheels.
3,043.	W. B. Hartridge. Tyres and wheels.
3,091.	C. Burnett. Resilient tyres.
3,502.	J. W. T. Cadett. Pneumatic friction clutches.
4,615.	G. McGhee. Variable speed and reversing gear.
6,747.	T. Clarkson and W. J. Morison. Regulators for liquid fuel burners.
6,805.	W. Jones and J. Hall. Friction clutch.
7,029.	J. S. Fairfax. Change-speed driving gear.
7,177.	H. Lucas. Acetylene lamps.
7,728.	W. B. Hartridge. Wheels and tyres.
7 735.	W. B. Hartridge. Wheels and tyres.
8,032.	W. Skaife. Water cooling devices.
8,751.	P. J. Grouvelle, E. H. Arquembourg, and L. J. Joret. Speed-controlling device.
10,613.	W. B. Hartridge. Wheels and tyres.
11,135.	F. R. Simms. Ignition devices.
12,459.	S. S. Stitt. Dust-settling apparatus.
13,339.	F. Toni. Tyres.
13,735.	W. Gibbs. Tyres.
15,198.	G. Cornilleau and A. Sainte-Beuve. Starting apparatus.
16,688.	F. Clements. Collapsible heads for motor landaulettes.

The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

No 270. (No. 10, Vol. XI.) MARCH 10TH, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.



CAUSE AND EFFECT.—The introduction of the motor 'bus into Cairo recently has been a source of considerable curiosity to the native Arabs. Although the fares charged are higher than the trams, the service is well patronised whilst the effect on the hiring of the donkeys, seen "making holiday" in the top picture, and so widely used in Cairo, has been very marked. The motor 'bus shown above is a De Dion-Bouton vehicle; one of the journeys made by this conveyance is from the Opera Place at Cairo to the Pyramids, a distance of 14 kilometres, for which only a charge equivalent to one shilling is made.

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

◆

British Events.

March	*4,000 Miles Tyre Trials.
March	*Lamp Trials.
March	*Speedometer Trials.
March 9–17	†Glasgow Motor Car Show.
March 17	Ladies' A.C. Meet at Montreal, Sevenoaks.
March 24–31	Cordingley and Co.'s Motor Show.
May 26	Motor Union Meeting (Birmingham).
June 11–16	Land's End to John O'Groat's (Auto Cycle Club).
June 13–16	Scottish Reliability Trial.
June 30	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July 21	Motor Union Meeting (Bath).
Aug.	*Van Trials.
Sept. 22	Motor Union Meeting (York).
Sept. 27	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

March 15–18	Vienna Motor Exhibition (A.C. of Austria).
March 25–31	Nice week.
April 1–15	Monaco Motor Boat Exhibition and Races.
April 1–17	Budapest Exhibition (A.C. of Hungary).
April–May	Milan Exhibition.
May 1–15	Paris Voiturettes Trial (*L'Auto*).
May 6	"Targa" Florio (Sicily).
May 13–14	Tour de France (Motor Cycles and Voiturettes).
May 14–31	Milan Reliability Trial.
May 27	Motor Bicycle Championship (Moto Club de France).
June 6–13	Herkomer Cup.
June 17	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 28–29	Kiel Motor Boat Races.
June 29	Motor Bicycle International Cup Race (Austria).
July 14–17	Ostende Meeting.
July 26–Aug. 15	Circuit Européen.
Sept. 10	Florio Cup Race (Italy).
Sept. 15–16	Mont Ventoux Hill-Climb.
Sept. 20	Lake Major Motor Boat Races.
Oct. 5–14	Leipzig Exhibition.

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* Automobile Club of Great Britain and Ireland Events and Papers.
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PASSING EVENTS.

No Motor Car Act this Year.

In spite of the hysterics and ecstatics of the Highways Protection League, in spite of the weird novels which they have incited enthusiastic ladies to compile, in spite of the Motor Car Commission, whose report is expected at the termination of its labours (as the judges in the Court of Appeal say) "shortly," we believe it is more than probable that there will not be any new Motor Car Bill introduced this year, after all. Of course, we may be wrong, but we base this opinion on an inspired *communiqué* published in a paper which may now be regarded as semi-official. The revelation is made in very discreet language, and there are a good many people who might read it and be quite uncertain as to what it was all about. The passage we refer to is as follows:—

> In view of the statement that the report of the Royal Commission on the working of the Motor Car Act will be issued in a few days, much interest was manifested yesterday in the question whether there would be any new motor legislation this year. The question may confidently be answered in the negative. It is obvious that the Government will have all it can possibly do to carry out its present programme, and if there were any prospect of space there are several matters which would demand this much more urgently than new motor legislation. The Act is working well enough, and the tension which once existed between motorists and the public is fast disappearing. The motor party in the House will therefore have nothing to do this session. The present Act will simply be continued till next year's legislation.

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The Expiring Statutes Continuance List.

Now if this means anything, it means that the existing Motor Car Act will be placed on the Expiring Statutes Continuance List, a simple method of keeping it in force for another year without trouble or practically any discussion, and one which has paved the way to practical immortality for many a measure which was never originally intended to remain in force for more than a year or two. In fact, an interesting example in point is provided by the old law of 1865, which reduced the speed of self-propelled traction on our highways to 4 miles an hour, and insisted on a man walking in front of the self-propelled vehicle to give warning to approaching horses and carts. This specimen of legislative wisdom was kept alive by being placed on the Expiring Statutes Renewal List from the time it was passed till the date of its partial repeal in 1896.

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Probably a Good Thing.

The prospect is not altogether unsatisfactory. The Act, we all know, is far from ideal. The speed limit, needless to say, is its principal blot, and there are a lot of minor inconsistencies and incongruities which sometimes are annoying and affect individuals harshly or unfairly, but when all is said and done, the exact effect of an Act depends far more on the method of its administration than on its actual phraseology and wording. And the Act is certainly being just now administered with far less hostility—we might, indeed, say ferocity—than was the case a year or two ago. Every year that passes will see a diminution of prejudice. The friends of the motor are growing rapidly in numbers. Its enemies are disappearing fast, and even county magistrates, in many places, have become votaries of the new locomotion. Above all, the police have been not merely encouraged, but absolutely exhorted under threat of pains and penalties by the new Home Secretary, not merely to tell the truth—a simple virtue which since the coming of the motor many are disposed to think that they have forgotten—but even to state what they may *know in an accused person's favour*. With all these influences working together for good, we really think it is quite possible that we may get through another year with the present Bill quite comfortably, and then perhaps there will be time to thoroughly digest the Report of the Royal Commission, and perhaps make the necessary amendments in the present Act, rather than that a wholly new one should be drafted. It must never be forgotten that "time is on our side."

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Taxation of Motor Cars.

Of far more terrible import for automobilists than the prospect of the continuation of the present law, are the rumours of increased taxation for automobiles, which are appearing in the daily Press. The authorities are said to be of opinion that a much larger proportion of the taxation of the country should be contributed by the automobile than it at present bears. There are suggestions, too, that the scheme most likely to be adopted will comprise a sliding scale by which cars will be taxed in proportion to their value. If motorists could receive some guarantee that the proposed increased taxation would be accompanied by some guarantee of freedom from what one can only call the blackmail of police court fines, they would probably be readily reconciled to the new arrangement, however unjust they might think it. But we fear there is little prospect of this being the case. The increased taxation will go to the Inland Revenue, whereas the fines collected in police courts go to the relief of the local rates. To make increased taxation of automobiles anything but a monstrous injustice, it should be accompanied by at least two other measures. One of these is that a large proportion of the money furnished by the increase should go to road maintenance, and the other is that the fines collected in local police courts should, as we have systematically advocated, be paid into the National Exchequer, so that the persons who administer the law locally should have no direct object to gain in obtaining as many convictions and fines as possible. If the proposal for increased taxation is really brought into the House of Commons during the present session, or even the present Parliament, it will certainly be incumbent on the motorist Members of both Houses to do their utmost to ensure its being accompanied by these safeguards.

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Silencing the Motor Cycle.

For years past we have from time to time drawn attention to the nuisance caused by the noisiness of so many motor cycles, and the prejudice which has, in consequence, been created against that branch of self-propelled locomotion. In fact, we are quite certain that had manufacturers been more careful on the point, had they been more considerate both of the nerves of the public and of the rider of the machine, by really supplying adequate exhaust boxes, it would have distinctly benefited the motor cycle trade. Instead of getting less noisy, we believe, as a matter of fact, that the motor cycle has during the past year become noisier than ever. It is with much satisfaction, therefore, that we realise that official notice of the situation has been taken by the Auto Cycle Club, and that at the last meeting of the committee "the question of more effectually silencing the exhaust of a motor cycle" was discussed, and a sub-committee appointed to draw up rules for a silencer competition. It is a beginning, no doubt, and we hope it will lead ultimately to silence. Car manufacturers have found it pay them to make cars as silent as possible, and presumably the manufacturers of motor cycles will ultimately do the same.

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The "Duchess" of our Canals.

The suction-producer motor barge, "The Duchess," whose triumphant career from London to Manchester we followed in the pages of this Journal stage by stage, has returned safely to her home at Chiswick. On the arrival of the barge at Manchester, we dealt at some length with the various features of her cruise, as reported by Mr. Thomson in the *Standard*, and the lessons to be drawn from them. We pointed out in THE AUTOMOTOR JOURNAL that among the things which the interesting experiment had taught were not only that a motor barge fitted with a suction-producer fed engine could successfully navigate inland waterways at an exceedingly small expenditure of fuel, but that if it was desired to get the best results from a vessel of the kind, our network of canals would have to be considerably improved, if possible widened, certainly deepened, and most of the locks reconstructed. The imperfections of our waterways were known before, but the experiences of the "Duchess" have brought them into greater relief, and have shown that if full advantage is to be taken of the application of the motor to the canal barge, our inland waterways will have to undergo a very considerable amount of renovation. It would, perhaps, be rash to connect the two occurrences as cause and effect, but, at any rate, it is noteworthy that the "Duchess" had scarcely concluded her tour when the Government announced the appointment of a Royal Commission to enquire into the canals and inland navigation of the United Kingdom, to report on their present condition, financial and otherwise, the reasons why private enterprise has not stepped in to improve them, and chiefly as to what improvements and extensions are desirable in order to complete a thorough communication by water between various industrial centres. In addition to these important points the Committee will have to consider the prospect of benefiting the country's trade by reforming our canal system, and the expediency of canals being made or acquired by public bodies or trusts. The enquiries of the Committee will unquestionably take up a considerable amount of time, but there is every reason to believe that the intentions of the Government are serious in the matter, and we trust to see in due course a satisfactory report not merely issued by the Committee, but at no very distant date embodied in practical legislation. Should this be, a splendid field will be opened up to motor boats of all kinds in this country, and a great expansion of the motor boat building industry, particularly in the building of motor boats for transport, may be confidently anticipated.

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English Canals not the only Sphere.

In this connection, it is of interest to bear in mind that besides the canals and waterways of the United Kingdom the great dependency of India provides an opening for the motor boat and the motor barge on an even more extended scale. From the last Board of Trade returns available—those of 1898—it appears that the total mileage of canals in this country is 4,000 miles. From the paper recently read before the Society of Arts by Mr. Robert Burden Buckly, it appears that in India there are 12,000 miles of main canals and 30,000 miles of distributed channels. Many of these canals, it is true, were mainly constructed for irrigation purposes, but for great lengths they are wide and deep enough for steamers to ply on, and certainly the motor boat, if not the motor barge, might find a wide sphere of usefulness on these. There are, moreover, at least three very important canals in India which have been constructed solely for navigation, and not for irrigation at all, and several minor ones of the same class. It would appear, at any rate, that perhaps more than half of the total mileage of the Indian canals is, or easily might be, rendered navigable, and consequently the day is, in all probability, not very far distant when the motor boat and the motor barge on these extended Indian waterways will prove a genuine blessing to the great dependency.

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Automobile Responsibility in Germany.

It would seem to have come at last, if we may credit the *Daily Telegraph*, and the report is confirmed by the *Allgemeine Automobile Zeitung*. We refer to the proposal which has been discussed for a long time past in Germany, of making automobilists fully responsible for any injury that may be inflicted by their cars on other people. A Bill, we are told, is to be shortly introduced into the Bundesrath, and then into the Reichstag, which bears a German name the meaning of which is that motor car owners will have precisely the same responsibility towards everybody that a railway company has towards its passengers—perhaps rather more. According to this wonderfully comprehensive measure, the owner of an automobile will have to make permanent provision for the widow and orphans of any person that may be killed by his car, besides bearing the cost of the funeral and any other incidental expenses involved. Where the car has merely inflicted an injury on somebody its owner will be let off more lightly. In that case he will be merely compelled to pay all medical expenses, and support the victim until he is well enough to resume his ordinary avocations. If the person who has been "accidented" by the car happens to have belongings in the shape of a wife and children, it will be the privilege of the happy car owner to defray the cost of their maintenance until their "bread-winner" (we believe that is the charming expression employed in these cases) is well enough to win bread again. Finally, if the victim of a motor car accident is permanently disabled, the owner of the car will have to grant him a pension for life, or make up any deficit in his earning powers which has resulted from the accident.

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A Premium on Hari-Kari.

The prospect for the automobilist can hardly be regarded as entrancing. So far as we can make out from the information now furnished, and from the discussions which have taken place on the subject in the German automobile press, *the question of contributory negligence does not come in at all.* Apparently, if the victim deliberately runs under the wheels of an approaching automobile and is killed, the owner of the car will have to fit him out with a funeral, and make permanent provision for his widow and orphans. Here is an opportunity for self-sacrifice. Anyone who has so come down in the world that he can no longer support his wife and children, will, if he has a spark of the heroic in him, at once throw himself beneath the wheels of an approaching German automobile—or perhaps better still, a foreign-owned car, and thus make the detested foreigner maintain an honest German family—knowing that he himself will be decently buried, and his widow and orphans looked after in future. There is one small item which the German Government seems to have neglected. It is the sort of thing that one would rather expect from the German character, and that is the question as to what is to happen to the heroic soul who dies for his wife and family if the owner of the automobile under which the self-immolator throws himself happens to be hard up himself. We think, under such circumstances, the Government is bound itself to provide the funeral and the other items, unless they compel every car owner to carry a large shield declaring his solvency, and giving information about his financial condition.

In fact we are not at all certain whether the German Government's Bill, if the Reichstag ever passes it, will not ultimately be destined to revolutionise the ethical code of Europe. To commit suicide under a motor car would be an honourable way out of all your difficulties, and would thenceforward doubtless take the same rank in Germany that hari-kari, the suicide of honour, enjoys in Japan. And it will not be open to the reproach of ordinary suicides.

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Smashing the Industry.

That there will be a large number of automobilists who also will commit suicide goes almost without saying. When an unhappy car owner has, say, three widows and twelve children dependent on him, and has buried three out-of-work bread-winners who have adopted this method of providing for their families, he will probably take his car and run violently down a steep place into the sea. Seriously, if the German Government force such a measure through it can spell nothing less than disaster for the German automobile industry, of which Germany is so justly proud. Fortunately, the industry commands a sufficient influence, we feel convinced, to prevent the passage of so absurd a measure of injustice. Of course, railway responsibility is one thing, and in the public interest it is particularly far-reaching in Germany, because the State owns practically the whole of the railways. But to fasten a similar responsibility on individual automobilists is a piece of grandmotherly legislation that we cannot for a moment believe has a serious chance of passing into law in a sensible modern State. Can it be that the whole thing is devised to ruin automobilism and prevent it competing with the State-owned railways?

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The Eternal Problem—London Traffic.

It almost looks as if many of us who are now alive may survive to see a real and effective Hausmannisation of London, a cause which The Automotor Journal has always had deeply at heart and which it has advocated in the past many a time and oft. It does not, of course, do to be too optimistic. When we call to mind that London was once burned down, that a great architect, Sir Christopher Wren, wished to reconstruct it with broad streets and expansive boulevards, that, like nearly all great and far-seeing men, he was overruled by the incompetent mediocrity of his own day, and that London was rebuilt in spite of him on its old silly and stupid want of plan, one is disposed to think that it will be ever thus. Nevertheless, there are now signs of a change, for the pressure tending towards change is becoming tremendous. A very large part of this pressure has been due to the activity and reports of the Commission on London Traffic, particularly the activity and reports of the engineers who have not always seen eye to eye with the more exalted personages whom it was their duty to advise. Another addition to the pressure, and a very substantial addition, too, was provided by Captain G. S. C. Swinton, who, with Sir John Wolfe Barry in the chair, read a paper last week on "London Traffic," before the Society of Arts. Captain Swinton's paper, extracts from which are given on another page, provided a most carefully thought-out treatment of this perplexing problem of the ages, and as is often the case with profound and accurate thinkers, it was full of delightful humour as well as the most drastic proposals. Encouraged no doubt by the Report of the Royal Commission, Captain Swinton spoke of cutting new thoroughfares through London, with a calm insouciance that would have made the hair of the last generation stand straight up on their heads and never come down again. When proposals of this kind can be put before a body like the Society of Arts, calmly discussed there, and find general support, it certainly does seem to indicate that at long last the only possible method of making order out of the terrible chaos of London traffic has a real chance of being adopted some day.

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A Problem in Two Parts—Will the Motor 'Bus Triumph?

If London, with its enormous annual increase of population, its equally rapidly-increasing business, and its far more than rapidly-increasing traffic, is not to remain the city of dreadful bemuddlement that it is at present, or rather not to become far worse, two things will have to be done. Sensible broad highways, as proposed by the Royal Commission on London Traffic, by Captain Swinton and by others, will have to be driven through the town, no matter at what cost. It is projects of this kind that we have termed above the Hausmannisation of London, from the name of the man who under Napoleon III. performed a service of this kind for Paris. The other thing that it will be necessary to do is to eliminate the horse from London streets. We simply cannot any longer, as Captain Swinton points out, afford to go at the horse's pace, even if there were no other objections than those of a sanitary nature, which every year become more serious. Already sixteen millions have been spent in tubes simply that we may go faster, and how much in laying down electric trams we may *perhaps* know when the Finance Committee of the London County Council sends in its report. From our point of view there is no objection to the tubes. They are out of the way, and for those who like their scenery and atmosphere they form an ideal means of transit between certain fixed points. There remains the electric tram and the motor 'bus. It is between them that the duel for carrying the traffic that we trust before long to see circulating in the broadened and beautified streets of our Hausmannised London, will be waged. We have not much doubt as to which will emerge the victor, and we are glad to find that Captain Swinton, and some of those who took part in the discussion—even electrical engineers who might be prejudiced the other way—were palpably of the same opinion. More than half the benefits of street widening, as we have pointed out over and over again, will be sacrificed if into the widened street is admitted the double row of rails of the electric tram. A city that widens its main thoroughfares at enormous expense, and congests and stops them up with double rows of trams, is forcibly reminiscent of the sailor of the legend, who endeavoured to lengthen his blanket by cutting a piece from the bottom and sewing it on to the top.

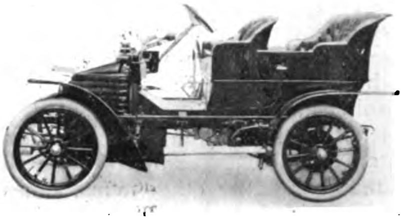
How to Recognise the Cars of To-day.

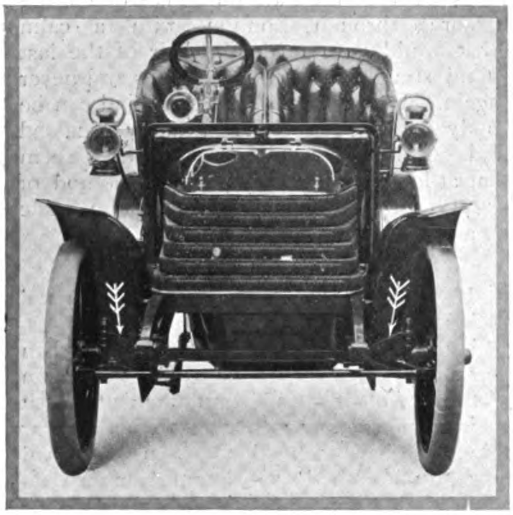
(No. 9).

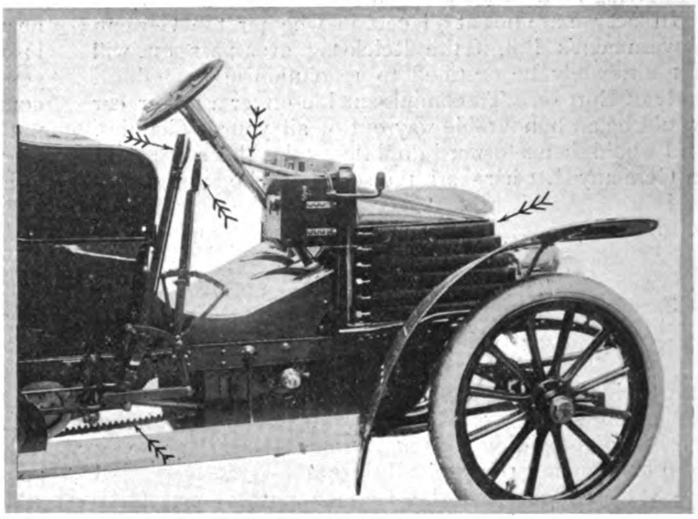
Wolseley Cars.

(BRITISH)

6, 8, & 12 H.P.







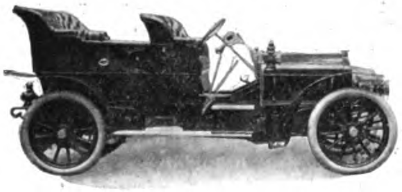
All Wolseley Cars of every age and type can be recognised by the RADIATOR WHICH SURROUNDS THE BONNET. A STAY SUPPORTING THE STEERING COLUMN from the Dash is fitted to all models, and the SIDE LEVERS, which have separate fulcrum points are very distinctive. On most cars the RENOLDS CHAIN is visible beneath the frame, and another constructional peculiarity is the FRONT AXLE.

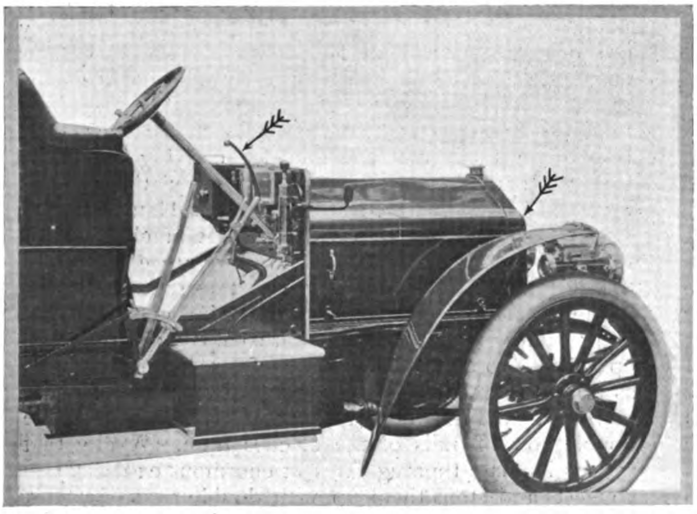
(No. 10).

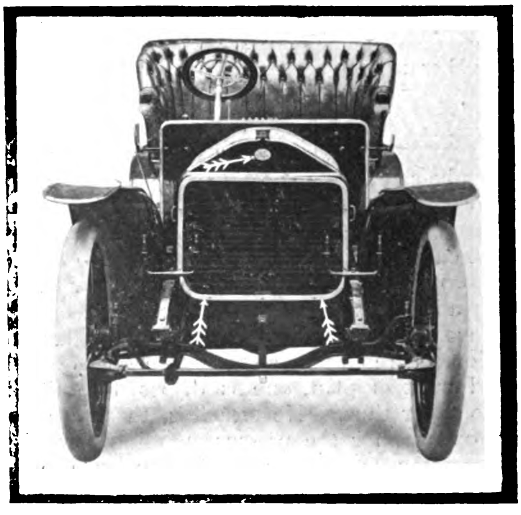
Siddeley Cars.

(BRITISH)

12, 15, 18, 25, 32 & 70 H.P.

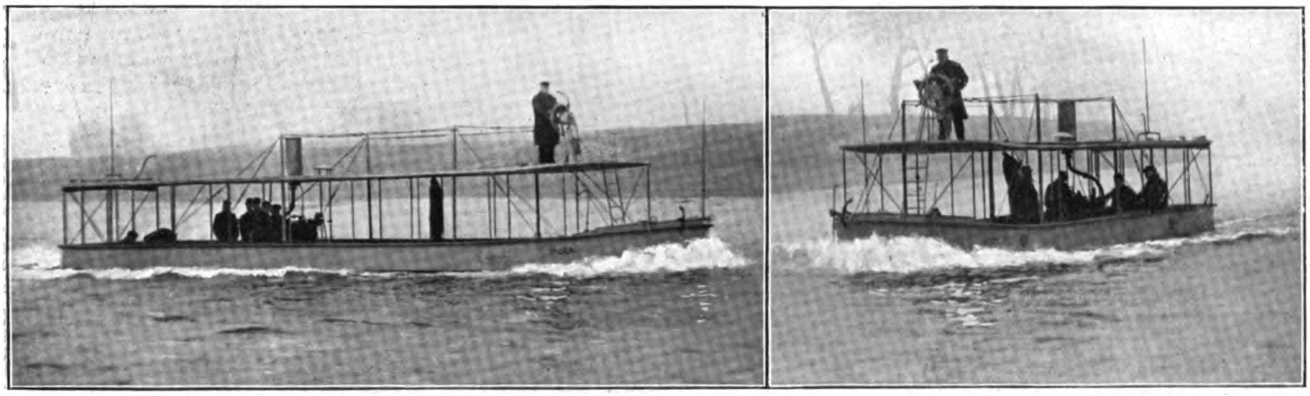






One of the most striking features of these cars is the PLATED BORDER ROUND THE RADIATOR, but the general lines of the BONNET are also very distinctive. Projecting from the Dash, and arranged close to the Steering Column, is the LONG-CURVED IGNITION LEVER, which forms another characteristic fitting on Siddeley Cars.

THE "SPIDER" AND THE "SANDFLY"— TWO SHALLOW DRAUGHT MOTOR BOATS.

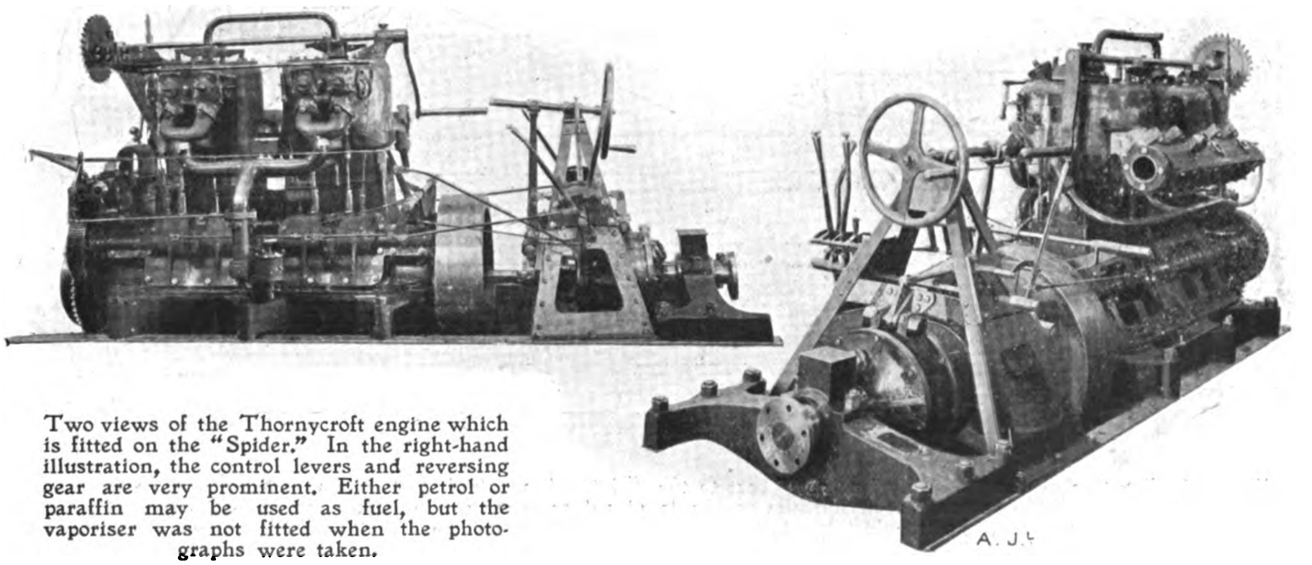


THE "SPIDER."—Two views of Messrs. Thornycroft's new shallow-draught motor boat.

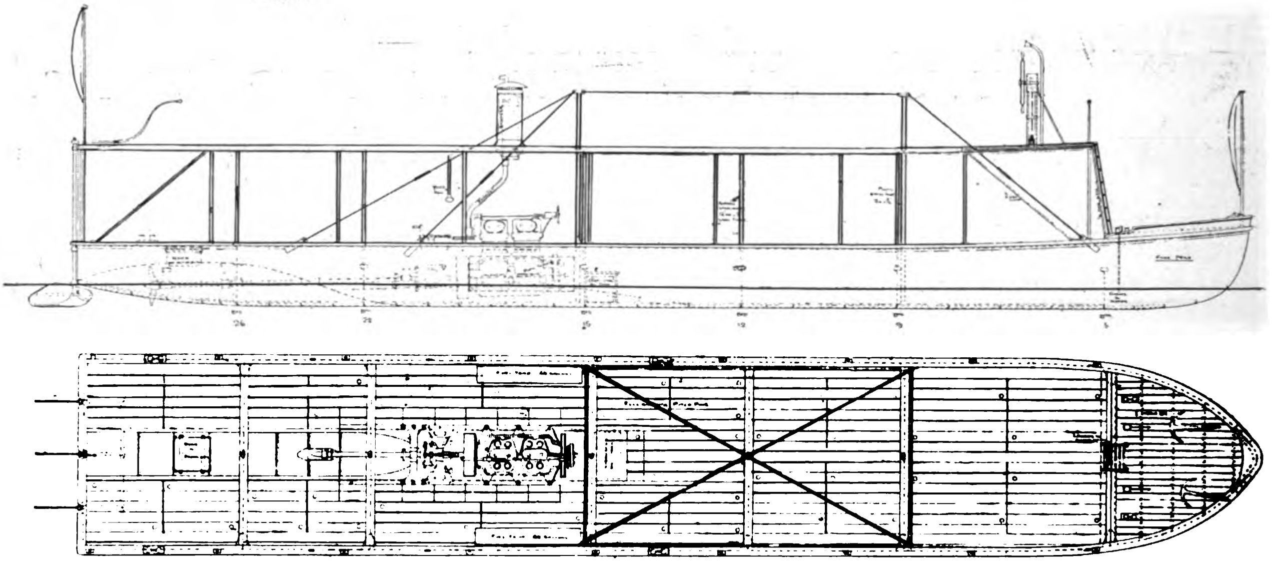
Everyone is aware that there are many important waterways in various parts of the world which are so shallow that boats which measure their draught in anything but inches are quite unable to navigate them. Shallow draught boats are therefore in universal use in many such places, and various improvements have been made in them from time to time in order to adapt them to the employment of modern machinery. Never previously, however, we believe, have boats of this type been fitted with internal combustion engines, and those which have just been built by Messrs. Thornycroft, to the order of the Crown Agents for the Colonies for service in Southern Nigeria, consequently have a very special interest.

One of these is called by the very appropriate name, "Spider," and two of our photographs show the general appearance of this curious looking boat. It has a galvanised steel hull, 56 ft. 3 ins. long with a beam of 9 ft., while the draught when carrying a 4-ton load is only 12 ins. The boat is, of course, practically flat bottomed, but the propellers—of which there are two on the same shaft—are accommodated in a kind of tunnel. So shallow is the draught that the propellers normally lie partly out of water, and it is only the peculiar properties of the tunnel system that is adopted which enables their full area to be effectively used when propelling the boat. A longitudinal section through the tunnel shows that the propellers lie under an arch which drops down to the water line again behind them. They are therefore quite enclosed in a chamber which is sealed all round by the water. Directly the propellers commence to revolve they expel the air from the upper half of this chamber, which immediately fills with water, and remains full so long as the propellers are in motion. In this way the propellers are able to work against a full head of water just as would be the case were they fully submerged at all times. This construction also has the advantages of enabling the propeller shaft to be quite horizontal, and of rendering the propellers very accessible.

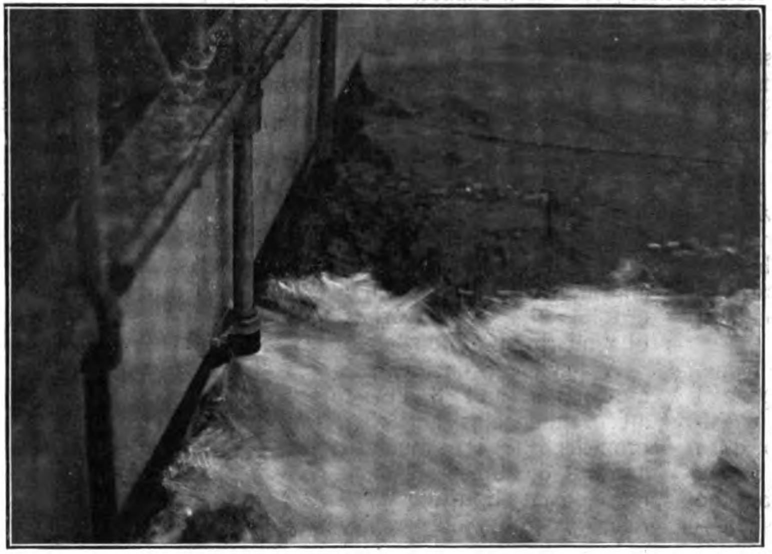
A 4-cylinder engine, of which the bore and stroke are 6 ins. and 8 ins. respectively, is placed just aft of amidships, and this is used to drive the two propellers. It is of much the usual form of construction, and has, combined with it, a reversing gear, as shown in our separate illustrations. At 800 r.p.m. the engine develops 40 h.p. on paraffin, but, as it is intended to run only at 380 r.p.m., only 25 h.p. is usually available. An awning deck is provided, for the boat lies very low in the water, and upon this are mounted the tiller and steering-wheel. There are three parallel rudders, all of which are connected together. Also mounted on the deck is a short



Two views of the Thornycroft engine which is fitted on the "Spider." In the right-hand illustration, the control levers and reversing gear are very prominent. Either petrol or paraffin may be used as fuel, but the vaporiser was not fitted when the photographs were taken.



Plan and Elevation of the "Spider," showing the arched tunnel in which the two propellers work, and the three balanced rudders.

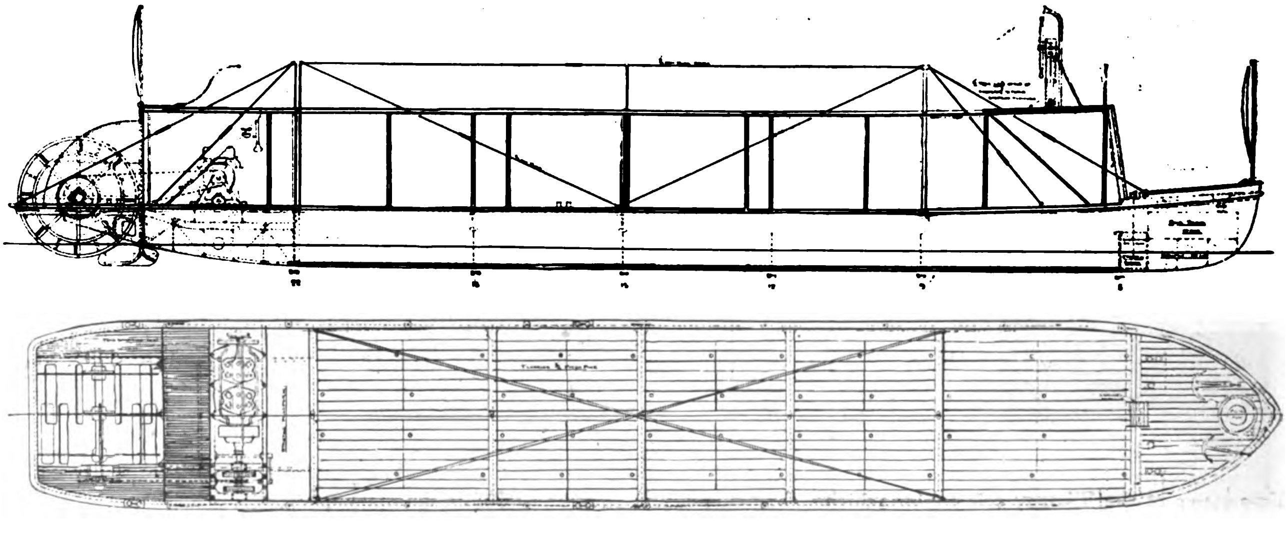


In the wake of the "Spider."—View of the wash from the two propellers, which work in a kind of tunnel beneath the stern of the boat. The small amount of disturbance is very noticeable.

chimney-like structure containing the engine silencer. Fuel is carried in two 40-gallon tanks fixed to the side of the boat.

The sister boat, called the "Sandfly," is of the same overall dimensions, but is fitted with a stern paddle wheel instead of propellers. The general arrangement of the two boats can be compared by the aid of our drawings. It will be noticed that the engine on the "Sandfly" is placed transversely and is right aft; it drives the paddle wheel by a single chain. Already the "Spider" has made a speed of 9¼ m.p.h., which is 2 m.p.h. above the guarantee.

A successful demonstration took place last Wednesday, when the "Spider" carried a large party of Press representatives up the Thames from Westminster Pier to Messrs. Thornycroft's works at Chiswick. On the return journey the engine was run on paraffin.

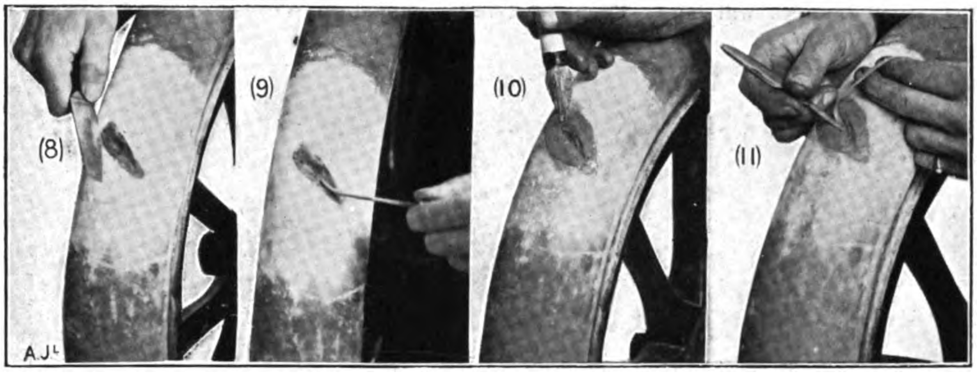


Plan and Elevation of the "Sandfly," a sister boat to the "Spider," and built to the same order. This vessel, however, is propelled by a stern wheel, and the engine is placed transversely to obtain the single chain drive. In other respects the boats, which are to be run under identical conditions in Africa, are similar.

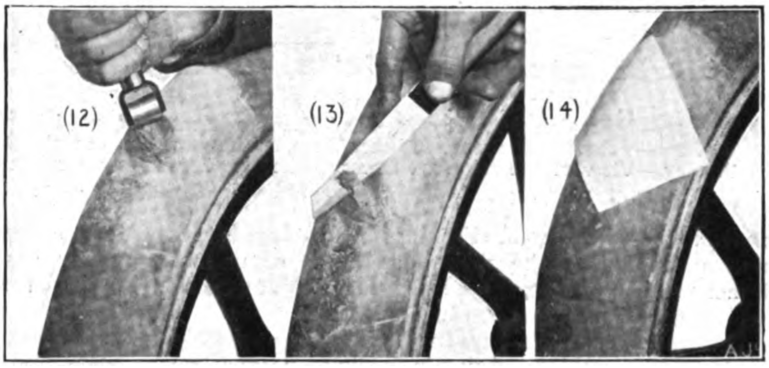
PERMANENT TYRE REPAIR, ON THE ROAD—(*Concluded from page* 256).

The Method of Operation.

PRACTICALLY, it may be said that there are three distinct processes which have to be performed when using the H.-F. Car Vulcanizer—or any other type of H.-F. vulcanizer—and we therefore propose to take each of these sets of operations separately and in order. Before doing so, however, it may be remarked that none of them involves any laborious work on the part of the operator, and that, provided reasonable care is taken, there is no reason why a thoroughly sound and durable repair should not be made by anyone who is willing to devote a little well-spent trouble to the task. The following are the three processes in question: (1) Getting up steam, and so raising the temperature of the vulcanizer to the proper degree of heat; (2) preparing the damaged tyre, ready for vulcanization, by building up the hole with new rubber; and (3) carrying out the actual process of vulcanization. Obviously, the first two sets of operations can be carried out simultaneously if desired, and time would be saved in so doing, but in this case an eye should be kept on the steam-gauge while putting the finishing touches to the tyre repair, and some motorists may even prefer to spend a little more time in order to avoid having to remove the apparatus from the lamp-bracket and fix it to the wheel while it is too hot to be handled comfortably. Such details as these are, however, optional, the main object of this article being that of demonstrating the manner in which each process should be conducted.



Figs. 8, 9, 10, and 11.—Repairing a Tyre. Preparing a Damaged Cover ready for Vulcanization. (8) Bevelling off the Edges; (9) Roughing the Surfaces; (10) Applying the Solution; (11) "Building-up" the Compound.



Figs. 12, 13, and 14.—Repairing a Tyre. Preparing a Damaged Cover, ready for Vulcanization; (12) Rolling down the new Rubber; (13) Paring off the superfluous Rubber; (14) Protecting the built-up repair with covering cloth.

Heating up the Vulcanizer.

Each successive stage, required for "getting up steam," is illustrated in Figs. 2 to 7, inclusive, and our photograph will, we think, be found almost self-explanatory. In Fig. 2, the lamp, E, is being filled with methylated spirit—the wick being thoroughly saturated with it; in Fig. 3, water is being poured into the boiler—the plug, A, having been removed for that purpose; and in Fig. 4, the lamp is being lighted. When filling with water, the cock, C, should be opened, as already indicated, and the operation continued until the water begins to run out through the blow-off snout; the plug, A, should then be replaced and tightened down. In Fig. 5, the lamp has been slid into place, and is being locked by the small screw, E^2—a penny being used to turn it round; on a windy day, in the open, it may be convenient to light the lamp through the hole, E^3, after, instead of before, it has been fixed in place. In Fig. 6, it will be noticed that the shield, E^1, is drawn back clear of the burner so as to allow the full heat of the flame to pass up all the tubes.

Under these conditions, it then takes about seven minutes to get up steam, and for the pressure-gauge to show a reading of about 50 lbs. per sq. in. At this pressure, the temperature of the vulcanizer is that required for the subsequent operation, and consequently it is necessary that the pressure should be maintained at exactly that point. For this reason, the extinguisher-shield, E^1, must then be pushed inward to approximately the position shown in Fig. 7, but should be drawn out a little if the pressure tends to fall, or pushed in a little further if it should rise.

When in actual use, it is extremely important that the correct pressure should be maintained, and in any case—even before applying the vulcanizer to the tyre—it is as well not to allow an excessive pressure to be reached; it is not so much that there is any danger in so doing, because the safety-valve will look after that, but it is undesirable to lose water by permitting any steam to escape.

Preparing the Tyre.

Every operation which has to be performed in getting the damaged tyre ready for vulcanization is shown by a similar series of photographs, in Figs. 8 to 14, to those with which we have just been dealing. In Fig. 8, the large gash which has to be repaired is being trimmed up with a knife—the edges of the hole being well bevelled off; in Fig. 9, the surfaces are being roughened with a rasp—in order to enable the new rubber to obtain a firm hold; and, in Fig. 10, the hole is being painted over with vulcanizing solution. Plenty of time is then given for the solution to dry, for it is essential that the naphtha in which the rubber is dissolved should evaporate while the gas can escape freely, as otherwise there is a risk that small bubbles will be formed in the rubber itself. For the same reason it is very important throughout the whole operation of repair that all moisture should be removed, any trace of water being highly objectionable and detrimental.

After the solution is dry, the building up process should be begun, this consisting in feeding a narrow strip of the special sheet compound into the hole (*see* Fig. 11). The great art at this stage is to pack the plastic compound closely, so that it forms a solid mass, and to avoid imprisoning any air between layer and layer; sometimes it is an advantage to slightly warm the compound, and thus make it even more plastic. This building up is continued until the new rubber stands up slightly above the level of the surrounding walls, and then it is rolled down well, as shown in Fig. 12. Next comes the paring off process, seen in Fig. 13, and then, just prior to applying the vulcanizer to the wheel, a piece of cloth is placed over the partly repaired wound; instead of cloth, paper (preferably glazed) may be substituted, but in either case a little French chalk should be sprinkled over the tyre beneath it.

Vulcanizing the Repair.

Although the actual time taken by the operation of vulcanizing the new rubber is that which occupies longest in practice, yet comparatively little need be said by way of explaining how it is performed. The vulcanizer is strapped on to the outer cover in the manner shown in Fig. 15, the tyre being first deflated slightly to enable the strap to be drawn up quite tight. Then the tyre is pumped up in order to give the necessary pressure against the hot vulcanizer, and the steam pressure is kept steady at 50 lbs. per square inch for a period of 25 to 30 minutes.

During this same time, the inner tube may also be vulcanized, as seen in Fig. 16, the methods employed when preparing it for this operation being those already described in a previous article in THE AUTOMOTOR JOURNAL (Sept. 23rd to Oct 7th last).

At the end of that period, the repair is completed, the vulcanizer may be removed, and the repair then has the appearance seen in Fig. 17. On close examination, the freshly-manufactured portion is found to have the same characteristics as the remainder of the tyre, and if the tyre were to be cut right across, through the patch, the new rubber and the old would be found to have virtually become one.

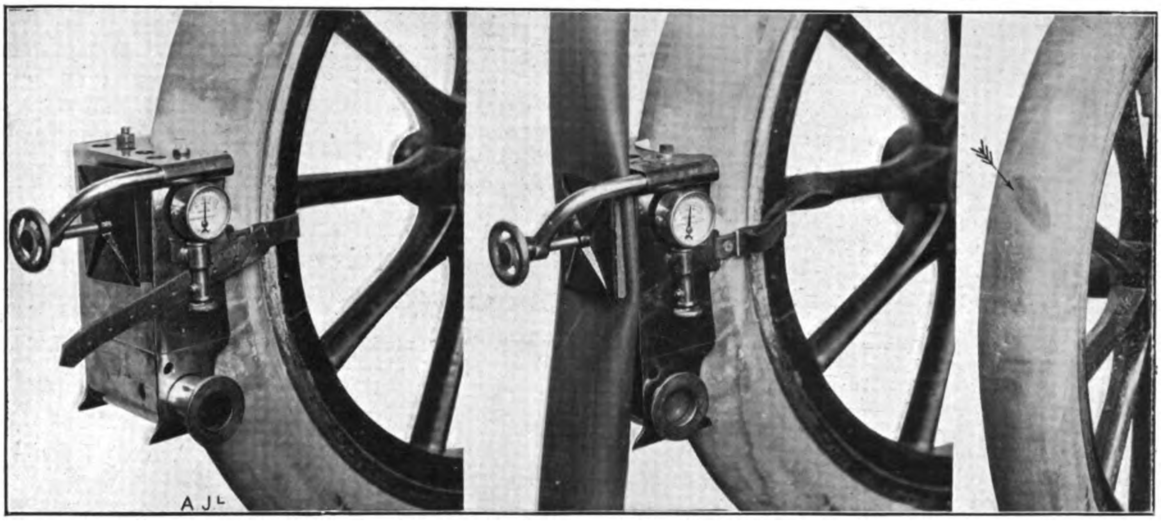


Fig. 15.—Vulcanizing the Repair—the "H.F." apparatus strapped in place.
Fig. 16.—Vulcanizing a repaired Inner Tube, at the same time that the Outer Cover is undergoing the same operation.
Fig. 17.—View of the Repaired Cover. The arrow denotes the re-manufactured portion that now takes the place of the gash.

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The Cap Trick.

ANOTHER case of the foolish "last across" business, or something very like it, resulted in the death of Albert Key at Stafford, through being knocked down by a motor car one day last week. The silly little boy had thrown his cap in the road in front of the motor vehicle, and in attempting to pick it up was knocked down, and received the injuries to which he ultimately succumbed.

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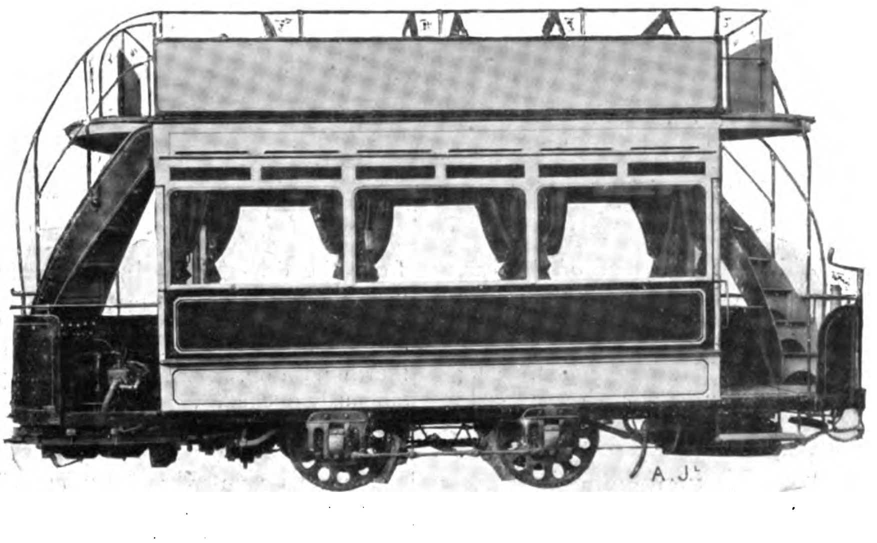
The Advantages of the Motor Lifeboat.

SEVERAL lifeboat stations, as our readers will recollect, have been equipped with motor lifeboats, and at the recent meeting of the City of London branch of the National Lifeboat Institution, Mr. R. Davies emphasised the importance of the superior speed of motor boats for life-saving purposes, and appealed to the public to make a special effort to defray the cost of supplying them.

PETROL MOTOR TRAMCARS.

WHERE the exigencies of the situation render tramcars inevitable, petrol motor-driven machines offer, as we have often pointed out, advantages which would weigh very strongly in their favour, with unbiassed minds, when compared with the orthodox electric installation. Petrol tramcars have had, hitherto, only a very small and isolated field of operation, and there is apparently little immediate prospect of this field extending very widely, so far as tramcars proper are concerned, more especially in view of the increasing popularity of the more flexible motor 'bus. In certain districts, more especially abroad, the tramway serves the purpose of a light railway, and it is in such cases, or where there are no roads at all, that the utility of the tram is especially applicable. Visitors to the Paris Show will recollect a little petrol tramcar constructed by Messrs. Turgan for the service between Trianion and Foret de Rouvray, and it is in such comparatively isolated services as these—and only in such—that it is possible to look upon the introduction of the tramcar, instead of the motor 'bus, with equanimity. In other cases, however, where tramcars, of the horse-drawn type, are already in existence, the petrol-propelled vehicle might well prove a profitable substitute, and one capable of raising an antiquated service to the level of the most modern electric system without the intervention of that appalling disorganisation of traffic which always precedes such a change, or the permanent disfigurement of our highways which generally results.



Petrol Motor Tramcar by the Scottish Motor Engineering Company.

It is interesting to find that a British firm should be building such vehicles; our illustration shows one of the machines recently made by the Scottish Motor Engineering Co., at their Edinburgh works. It is fitted with a 24-h.p. 4-cylinder engine—placed at one end of the frame—which transmits its power to the driving-axle through spur-gearing. A special form of control has been adopted by which the motorman can only drive the car in one direction from each end. When reversing, therefore, he has to go to the other end of the vehicle, and to carry the control-handle with him—which ensures that his forward gear is locked in the neutral position. Bodies capable of seating from 40 to 50 passengers are fitted to this chassis, the overall length of the smaller body being 13 ft. 1 in. Unladen, the vehicle weighs between 4 and 5 tons, and is stated to be capable of ascending a gradient of 1 in 15 with full load.

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TWO MOTOR SHOWS AT OLYMPIA—IMPORTANT DECISION OF THE TRADE SOCIETY.

THE Society of Motor Manufacturers and Traders have, we are officially informed, taken a momentous decision, viz., to exclude commercial vehicles from their annual International Motor Exhibition at Olympia in November next, and to hold a separate commercial show—also at Olympia—early in the following year.

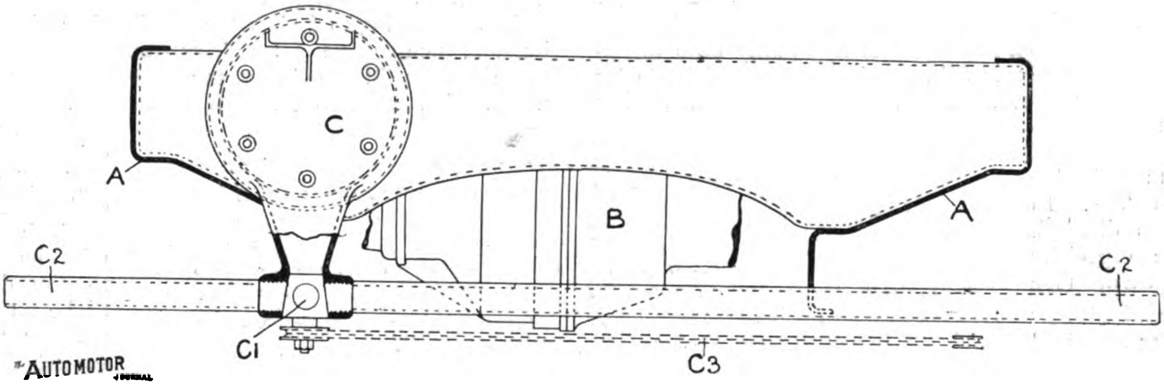
The reasons for this step are twofold. In the first place, at the society's two former Exhibitions at Olympia, there were complaints from both sections of the trade of insufficient space, whilst the large attendance of the public rendered it desirable if possible to increase the gangway accommodation. In the second place, the membership of the society has largely increased, and in spite of the increased accommodation obtained at great expense by improvements in what is known as the Annexe, it was plain that the building would shortly be unable to accommodate even the members, to say nothing of others who desire to exhibit. Moreover, the long-talked-of extension of the commercial side of automobilism is now rapidly developing, and it is no longer possible to relegate these exhibits to a section of another Exhibition. As a matter of fact, at the last Olympia Exhibition, the demand for space in this section was practically as great as for pleasure cars, and it is certain quickly to exceed it.

Under the new arrangement, the November 1906 Exhibition will, consequently, be devoted entirely to pleasure cars and their accessories, which can, therefore, be displayed in a more suitable manner. In April, 1907, the main hall will be filled with a show of commercial vehicles and their accessories. The Annexe will be available for marine motor exhibits, which formerly used to be crowded in amongst large business cars.

Machinery, which, in connection with the boats, makes an interesting feature at the Paris Exhibition, can then be displayed more in proportion to its importance.

THE "AUSTIN" EXHAUST DEVICE.

ON the new "Austin" cars, of which we have already given some particulars, a special device is being introduced for enabling the driver to direct the exhaust gases leaving the silencer, so that they issue out on the "near" side, the "off" side, or at the rear of the car, according as to which is least likely to cause annoyance under the circumstances prevailing at the time in traffic.



Our illustration demonstrates this arrangement, being a transverse section through the new 25-30-h.p. live-axle car, which, as will be noticed, has a specially-shaped pressed steel frame, A, and in which the silencer, C, is placed longitudinally just in front of the axle casing, B. Beneath the silencer, C, is a four-way cock, C^1, controlled from the driver's seat by the chain, C^3, and from this cock the two pipes, C^2, project out to each side of the car. The cock not only enables the exhaust to be emitted in either of the three directions, but has also a fourth position, in which all three passages are simultaneously opened.

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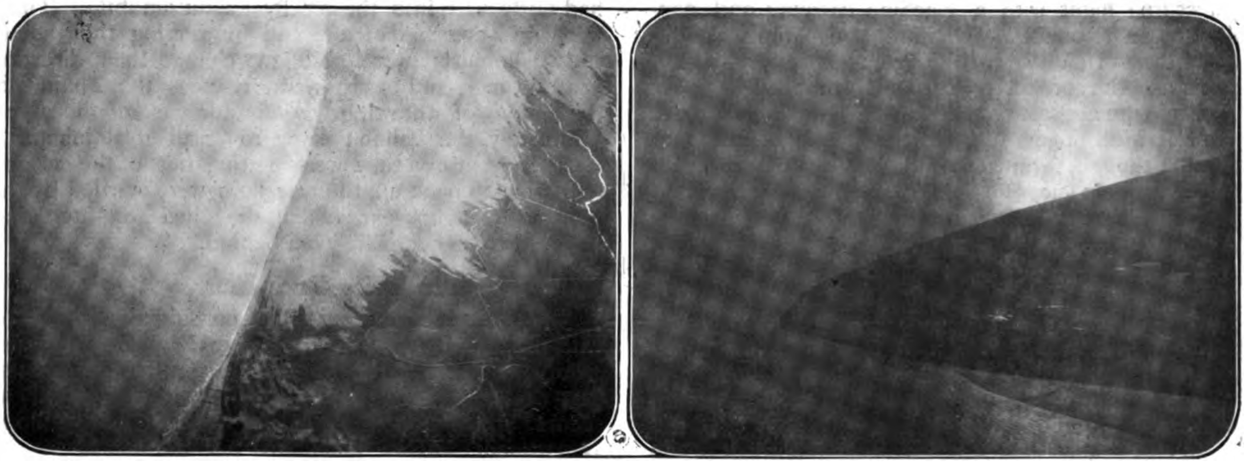
Old Friends—or Startling New Inventions?

IT is really very remarkable how often the same thing is invented and re-invented time after time, at what would be, in the case of any other industry than the automobile industry, quite frequent intervals, and it is perhaps an even more striking commentary on the limited extent to which the doings of inventors in the past are studied by present-day workers that so many re-introduced devices are looked upon as being entirely novel. One reason for this is doubtless to be found in the fact that the development of self-propelled vehicles has been extraordinarily rapid, in spite of the enormous amount, and the very varied kind, of knowledge that has had to be accumulated in so short a period. Whatever may be the cause, however, it has of late been even more marked than ever, and amongst the cases that have come before us within the past week or two are some notable instances that are worthy of passing mention. The Crépet change-speed-gear, for instance, has been spoken of lately in several of the French automobile papers as though it were not only entirely novel, but were destined to completely revolutionise present-day practice. The mechanism itself is, however, little more or less than that which was fitted to the cars made by the Motor Manufacturing Company a few years ago—the "Iden" gear—of which we gave a fully illustrated description on October 11th, 1902. All the wheels inside the gear-box remain in mesh with one another, instead of being brought into gear successively as they usually are, and all the wheels on one of the two shafts are normally free to revolve idly upon that shaft, while the shaft itself is fitted with keys that can be slid along from wheel to wheel, in order to lock anyone of the wheels at a time to it. Such, too, is the Crépet gear, in which ball-bearings are interposed between each of the wheels on the lay-shaft, and in which the shaft is moved bodily endways, with its projecting keys. Other "re-inventions" that have been referred to lately in this country are the "Lucas" and the "Lege" petrol engines, the former being constructed with two inter-geared crank-shafts, like the Tourand motor (*see* AUTOMOTOR JOURNAL of July, 1900, p. 511), and the latter having what we termed a "wobble" gear, when describing a similar—and a nearly as complicated—steam engine on August 30th, 1902. In America, curiously enough, a two-cycle engine—the "Lombard"—has also been designed lately on somewhat the same lines, but in that case the cylinders revolve as well as the power-shaft, and in this respect the engine is, to a certain extent, like a petrol engine that is now being experimented with by Mr. Lamplough, of the Albany Manufacturing Company, at Willesden.

The Automegaphonomobile.

AMONG the portents which Londoners and visitors may expect to see on the streets of the Metropolis this summer, will be a number of motor char-a-bancs or wagonettes filled up with American tourists and taken round all the principal thoroughfares of the Metropolis. They will be instructed by a typical showman learned in the lore of the town, who, to make his remarks fully comprehensible to the rapidly moving audience behind him, will spout forth history, archæology, topography, politics, society gossip, and miscellaneous information with, as Byron said, "a forty-parson power" through a megaphone with which he is to be armed. It is adapting New York methods to London City, and those who have gone through similar experience in New York have been absolutely astonished and their brains set in a whirl by the extraordinary amount of anecdote, information, and jocularity which has been poured into them through the megaphone. It will be an entertaining sight and a tribute in a way to automobile development as well as to the powers of the megaphone man.

AERONAUTICS.



The sand-swept land of Dungeness.

Last sight of England, showing Dungeness and the setting sun on the sea.

THE LAND AS SEEN FROM A BALLOON. Photographs by Mr. Spencer.

From the Heights.

To bring home to our readers how vastly different familiar objects appear when seen from the heights to which a balloon attains, we reproduce on this page several photographs, for which we have to thank Mr. Frank Butler and Mr. Spencer; these views were secured on the cross-Channel journey which we described last week. Taken in their natural order, they display a birdseye view of Romney Marsh and Hythe—Romney Marsh so dear to Barham, the author of the "Ingoldsby Legends," though probably even he would scarcely recognise it as here shown. The river had overflowed its banks, and looks somewhat like the photograph of an electric discharge. The long straight white line is the celebrated military canal that runs across Romney Marsh from near Ore past Winchelsea to near Hythe. It was the invention of the great Pitt, when Napoleon threatened to invade the country. The French were certain, he thought, to land on Romney Marsh, and the canal was excavated in order to provide a second line of defence. Barham made great fun in one of his stories of this idea, that the French, who had crossed half the rivers in Europe, would, if they once landed, be kept back by a 30-foot canal.

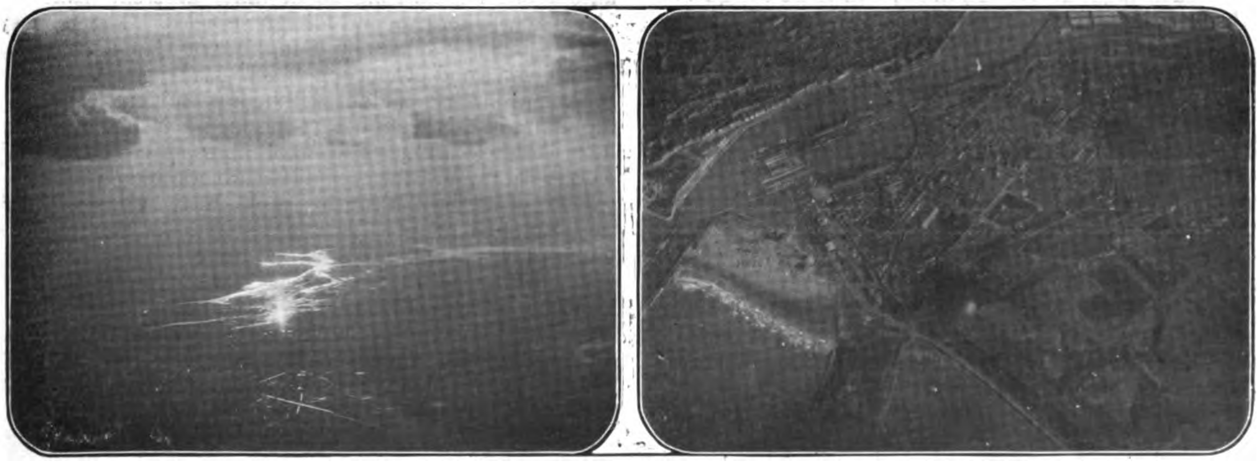
The next photograph represents a birdseye view of Dungeness with its sands, producing a very curious effect.

In the next photograph the balloon, leaving England, has descended to a considerably lower altitude, and the headline of Dungeness looms black against the setting sun.

Finally, the concluding view shows the first glance at Boulogne from high above the Channel.

Death of Professor Langley.

Everyone interested in aeronautics, particularly the heavier-than-air branch of the art, will learn with regret of the death of Professor S. P. Langley. Professor Langley was one of the most enthusiastic experimenters with aeroplane models, and it was with one of these, driven by a small steam engine, that a free flight of about a mile was executed over the Potomac River in 1896. This machine, it will be recollected, consisted of two aeroplanes with di-hedral angles separated from one another by a certain space in which two propellers revolved, the whole machine being guided by a poly-



The Military Canal and overflowing rivers near Appledore.

Boulogne as seen from aloft.

THE LAND AS SEEN FROM A BALLOON. Photographs by Mr. Spencer.

hedral tail. The motor developed 1 h.p. Professor Langley was less successful when in 1904 he endeavoured to effect free flight with a machine carrying and controlled by an aeronaut. The intrepid experimenter who mounted the machine was the Professor's assistant, Mr. Manby, and the aeroplane, which was launched, or rather hurled into the air, from a landing stage on the Potomac River by a kind of catapult, almost immediately fell into the water, though, fortunately, Mr. Manby was uninjured. One cannot help surmising, in the light of more recent experiences, that this violent launching of the machine was probably largely responsible for the want of success. If a machine is capable of maintaining itself in the air it ought to be capable of rising from the ground into the air if mounted on a suitable carriage, whereas if hurled into the atmosphere at a high velocity, stresses and pressures are developed which render the conditions totally different from those under which the machine can maintain its equilibrium. Professor Langley was not only an experimenter, he was a writer and student of the principles of aeronautics and contributed a valuable amount of work towards the solution of the problem. By means of a large whirling apparatus, by which the lifting power of aeroplanes arranged at different angles could be measured, he discovered the fact with which his name will be permanently associated, that the faster an aeroplane is driven through the air, the less energy is required to keep it afloat.

Salomons Prize.

THE Technical Committee of the Aero Club have settled the general conditions governing this competition. The competition will take place in England this year, under rules to be drafted by the A.C.U.K., in accordance with the general regulations of the Fedération Aéronautique Internationale. It will be open to subjects of any country, and will be for machines of the heavier-than-air type, propelled either by human or mechanical power; every machine must carry at least one operator. The prize will be a 100 guinea Cup, presented by Sir David Salomons, Bart., and a money prize.

Invitation to the Brothers Wright.

THE Aero Club are inviting, through the Aero Club of America, the Brothers Wright to visit England in the summer, to give a demonstration of their flying machine, with which they recently accomplished a non-stop circular flight of over 24 miles, and to be the guests of the A.C.U.K. during their stay.

Historical Pictures for the Aero Club.

SIR DAVID SALOMONS, BART., a life member of the A.C.U.K., has presented to the club some historical framed prints on ballooning, which will be hung in the Club Room, at 110, Piccadilly, W.

Gordon-Bennett (Aeronautical) Cup.

To compete in this race for spherical balloons, which is announced to take place on September 30th, starting from the Tuileries Gardens, Paris, seven countries have entered, viz., France, Italy, Germany, Spain, America, Belgium, and Great Britain. Each country is allowed a maximum of three balloons only.

Motor Car *versus* Balloon.

AN amusing competition, perhaps we might almost say as far as this country is concerned a revival, of the sport of balloon hunting by motor car, was carried out on Saturday last, when the Aero Club's "Vivienne" made an ascent from Wandsworth, pursued as soon as it had fairly risen into the air by an automobile. There were cross-currents of air, and by varying their height the balloonists were able to change their direction several times, and to cross and re-cross the Thames in the hope of throwing the motor car off the scent. Ultimately, the balloon came to earth at Rainham, in Essex, and just as they were getting out of the car and preparing to pack up, the travellers were startled by the hoot of the motor car, which they had forgotten and believed to be completely left behind.

Count Zeppelin Tries Once More.

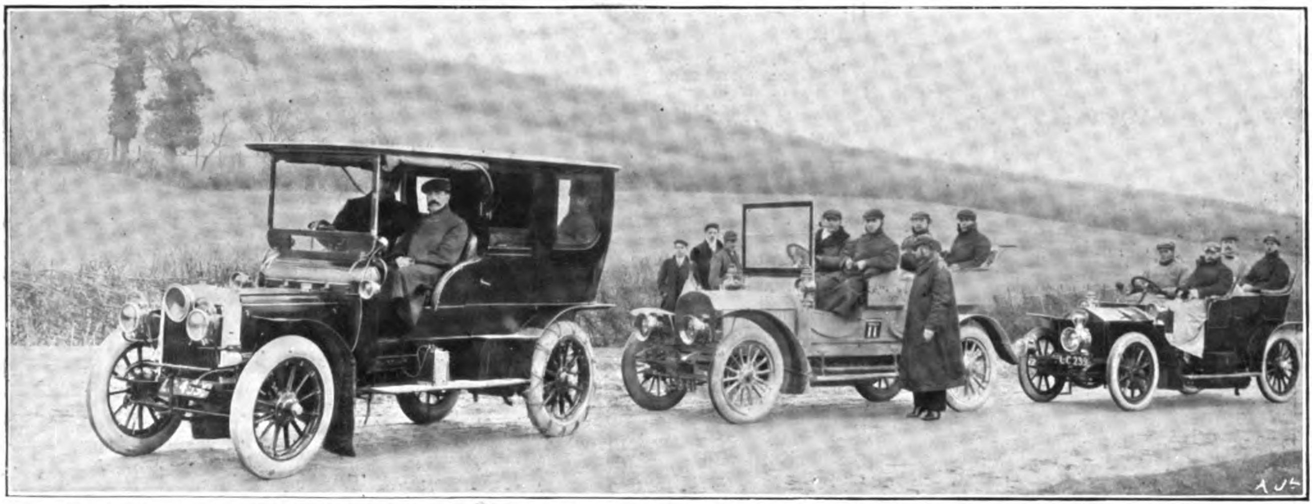
NEARLY everyone must feel considerable sympathy with the aged German experimenter, Count Zeppelin, and nearly everyone will be pleased to learn that he is not so cast down by the failure of his recent experiment as seemed at first to be the case, the German Army Balloon Department having come to his assistance, as we mentioned recently, and the War Office having arranged to assist him with all the necessary materials, a large staff of experts and workmen, and everything required to build another airship on improved lines. It is to be smaller than either of its predecessors, but it will, we understand, have greater motive power, and Count Zeppelin and his engineer, Herr Durr, are already at work on the plans for the new machine. No doubt this is Germany's answer to France, for the success of the Lebaudy airship and the military efficiency which has been accomplished with that splendid piece of design, has awakened a strong spirit of rivalry across the Rhine. Count Zeppelin's previous designs must, it would seem, be now regarded as demonstrably imperfect in principle. Probably the general outline will be completely remodelled, and we shall certainly not be surprised to learn that some of the general principles of construction adopted in the Lebaudy airship have been copied in the German machine.

* * * *

A Canadian Motor Show.

VERY strenuous efforts are being made in Canada for the holding of what promises to be a most successful automobile and motor boat show at Toronto, from April 7th to April 14th. Already sufficient exhibits have been assured to fill the entire space devoted to automobiles, comprising about thirty different makes of Canadian, American, and foreign vehicles. The keenest interest is being taken by a number of Canadian firms, including a good proportion of accessory dealers. Motor boats and marine engines will be a prominent feature of the Show, in this section a 31-ft. speed boat being shown by a Toronto firm. The total floor space comprises 24,000 sq. ft., and the committee are adopting a uniform scheme of decoration for the whole show, in like manner to the system adopted at the recent New York shows. Uniform signs will be provided to exhibitors without cost. Altogether the enterprise shown by the committee responsible for the organisation should help forward very materially the industry in the Canadian Dominion. A similar Show is, moreover, it appears, to be held in Montreal from April 21st to 28th. We shall hope to learn that, prominent amongst the exhibits at both exhibitions, will be found some models of the leading makes of British manufacturers. Hitherto the American makers seem to have almost entirely captured the Canadian trade.

TYRE, LAMP, AND SPEEDOMETER TRIALS.



THE A.C.G.B.I. TYRE, LAMP, AND SPEEDOMETER TRIALS.—The three cars on which the competing devices are fitted. On the left is a 28-h.p. Daimler, in the centre is a 20-h.p. Dennis, and on the right is a 20-h.p. Rolls-Royce. All the cars are shod with Collier tyres of different sections, and each car carries one or two speed indicators and one or more lamps. The Dennis car itself has also been entered for a test of reliability, but the performances of the other vehicles will not be recorded.

THIS interesting trial, which is being carried out by the A.C.G.B.I., is now in full swing; the three touring cars, loaded with the devices under test, having started their road trial on Thursday, March 1st, after having gone through preliminary tests in the garage. One of the cars—a 20-h.p. Dennis—is itself undergoing a trial of reliability, but the other two, which are respectively a 28-h.p. Daimler and a 20-h.p. Rolls-Royce, are not being observed as to their performance.

Collier Tyres.

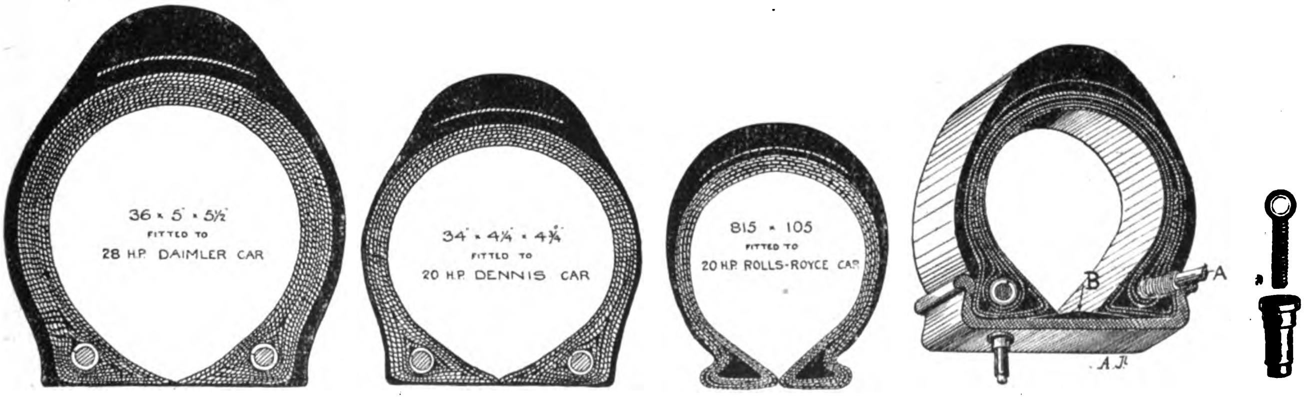
All of these three cars are shod with Collier tyres, but the section of the tyres on the respective vehicles differs in size and shape, as illustrated by the three accompanying line drawings. Those on the heaviest vehicle—the 28-h.p. Daimler—which weighs about two tons when loaded, are 5 ins. wide, but they measure 5½ ins. from tread to base owing to the great thickness of rubber in the tread. On the Dennis car, the corresponding measurements are 4¼ ins. and 4¾ ins., so that the additional half inch of tread still remains.

Both these sections have the well-known Collier attachment by which the tyre is secured in place by numerous small eye-bolts and nuts. The eye-bolts pass through the rim, and are threaded over steel rings which lie in wire-lined tubes inside each bead. This construction is very clearly illustrated by one of our drawings, which shows part of one of the steel rings, A, projecting from its channel. Another peculiarity to be noticed is the wedge-shaped rubber strip, B, which lies on the bottom of the rim, this filling the space between the edges of the beads. On the Rolls-Royce car, the tyres are of an "experimental" Collier type, for they have beaded edges, and their section lacks the extreme thickness in the bead.

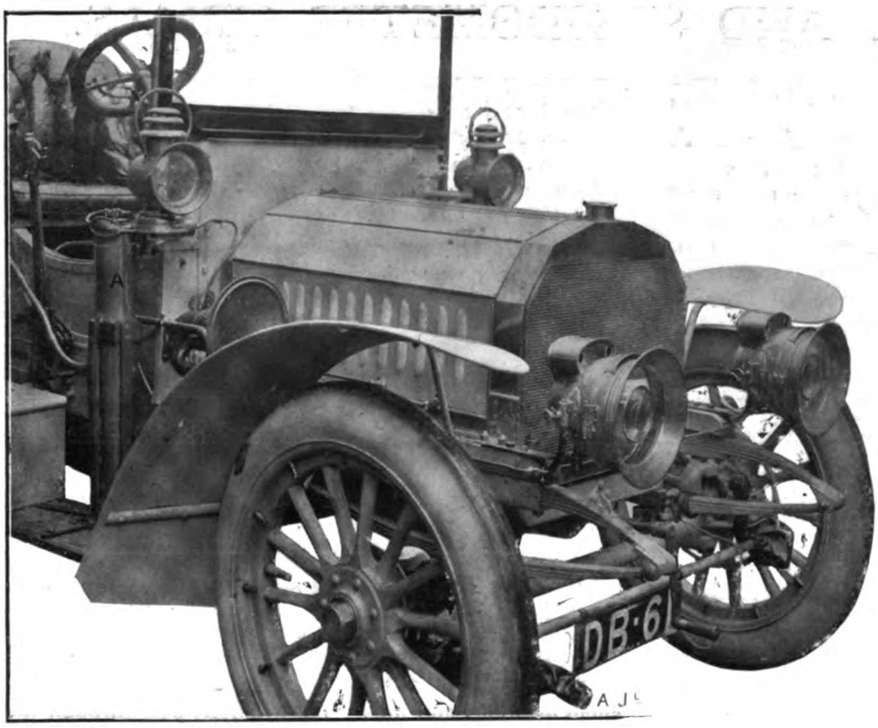
In addition to the Collier pneumatics, a set of Hartridge solid tyres, fitted to a 'bus chassis, has also been entered, but this vehicle has not yet started with the other cars, and the total distance it is required to run is less.

Lamps.

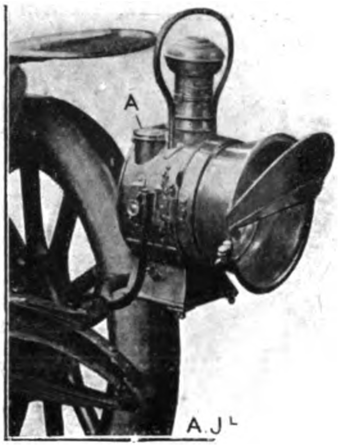
Only two headlights are competing, one entered by Worsnop and Co., which uses acetylene, and the other by Polkey, Limited, which burns paraffin oil. Of these, the former is peculiar for its generator, which, as is evident



THE A.C.G.B.I. TYRE TRIALS.—Sections of the Collier Tyres which are fitted to the Daimler, Dennis and Rolls-Royce Cars. The two larger sections are of the well-known Collier pattern, but the smallest section is that of an "experimental" set, having beaded edges and thinner tread. On the right is a section showing the construction of the standard Colliers, as also one of the small eye-bolts which are used to secure the tyre in place.



THE A.C.G.B.I. LAMP TRIALS.—View of the Worsnop Acetylene Headlights and Generator fitted to the Dennis Car. The Generator, A, —alongside the dash—is encased in a long cylinder. This cylinder, it will be noticed, is of comparatively small bore, and one result of this is that the surface of the carbide in contact with the water is not, therefore, unduly great when the generator is idle.



THE A.C.G.B.I. LAMP TRIALS.—View of the Polkey Headlight. This lamp consumes paraffin and is fitted with a long glass chimney. Two spare chimneys are carried in pockets, A, formed in the lamp casing. On the lamp illustrated, a reflector, B, has been added in order to enable the observer to see that the lamp is alight in the daytime —the trial taking place, of course, during such times as the car is running.

from our illustration, is very long, being enclosed in a narrow tube some 30 ins. in height. Owing to the shape of the retaining vessel, the area of carbide on which the water acts when the lamp is at rest, is comparatively small.

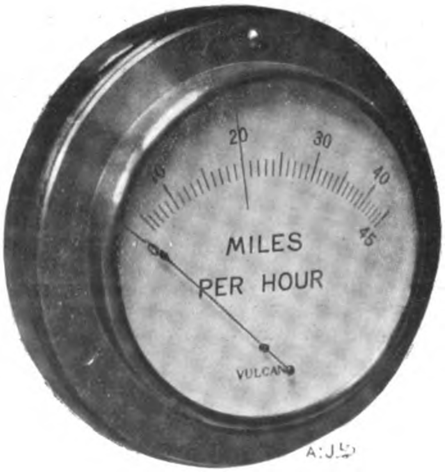
THE A.C.G.B.I. LAMP TRIALS.—View of the Metallic Mirror Company's Tail Lamp. This device is entirely self-contained, and consists of a rectangular box lined with reflecting material and faced with a red window and transparent number plate. Owing to the internal arrangement, the light is evenly diffused, and the lamp is also well protected.

The Polkey headlight, of which we also give an illustration, is constructed on the principle of an ordinary domestic paraffin lamp, and it has the usual glass chimney over the burner. In case of breakage, two spare chimneys are carried in tubes constructed for this purpose in the body of the lamp.

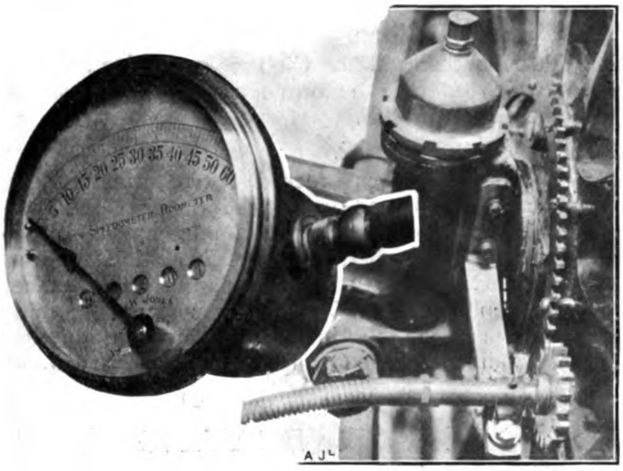
There are also three tail lamps in the trial, one of them has been entered by Messrs. Worsnop, who entered a headlight, another by Messrs. Ryta and Hoult, and the third by the Metallic Mirrors, Ltd. This last is a very neat arrangement, for it combines a red light and transparent number plate as a complete unit. The lamp is enclosed in a rectangular box which is lined with metal reflectors, so that the light is evenly diffused throughout the interior.

Speedometers.

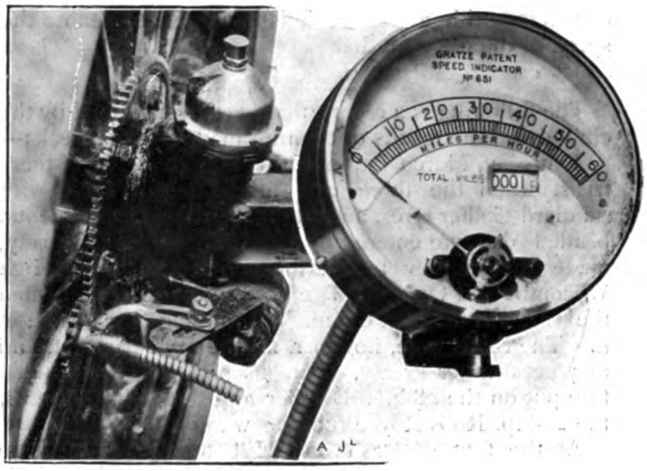
Quite a number of these instruments have been entered, but as there are so few vehicles to test them on, only five instruments are at present under trial, and the remainder will, therefore, be fitted during the latter period of the trials. Those now in use, of which we give photographs, are the Jones, Gratze, Vulcan, Cowey, and Warner. They represent a diverse selection of principles, and include examples of the mechanical, magnetic, and electrical types. THE AUTOMOTOR JOURNAL series of articles on the subject of speed indicators—part of which has already been reprinted in book form in the series of the Automotor Library—has already dealt thoroughly with so many of the instruments now on the market, that only a brief reference to the instruments mentioned above will be necessary. In every case one of the front road wheels has been the place selected for the attachment of the driving



THE A.C.G.B.I. SPEEDOMETER TRIALS.—View of Vulcan Speed Indicator. This is an electric instrument, the indicator itself being virtually a hot-wire voltmeter which records the electric pressure generated by a little magneto driven from one of the road wheels.



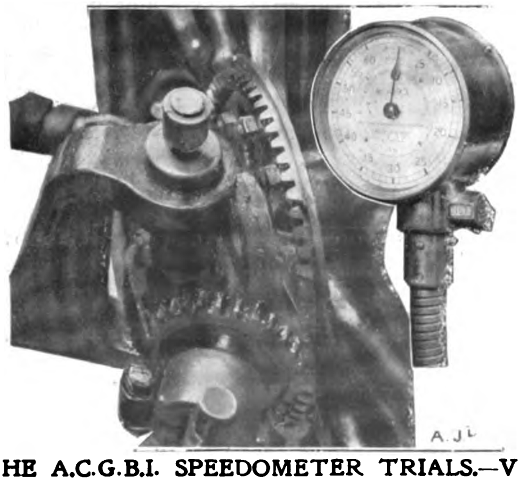
THE A.C.G.B.I. SPEEDOMETER TRIALS.—Views of the Jones Speedometer and its driving gear. A centrifugal governor controls the action of the pointer in this instrument and in conjunction with the indicating mechanism is an odometer for registering the mileage covered.



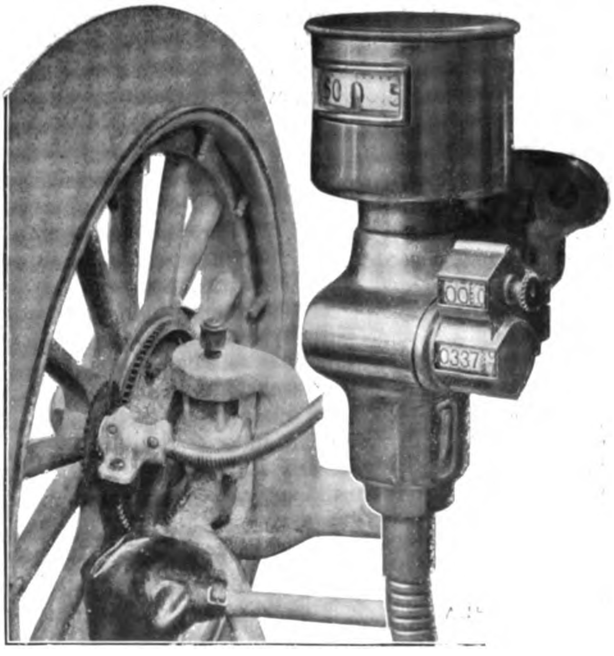
THE A.C.G.B.I. SPEEDOMETER TRIALS.—Views of the Gratze Speed Indicator and its drive. The flexible shaft causes a small iron armature to revolve between the poles of a permanent magnet and, acting upon a copper drum to which is attached the pointer, rotates it out of its normal zero position.

mechanism, and, with the exception of the Vulcan, which stands apart, some form of spur-wheel gearing has been employed. Our illustrations show such differences as exist between model and model, but, although a bevel gear is used by the Cowey, they are all, it will be noticed, virtually alike. The Vulcan, which is the only purely electrical device, has a tiny magneto driven by an elastic belt from a pulley attached to the front wheel. On the dashboard is a voltmeter, calibrated in miles per hour, which registers the voltage generated and so indicates the speed of the car.

Both the Gratze and the Warner instruments are magnetic; the former has already been described by us both in its original and latest forms, while the latter is at present under test preparatory to our impending article. Both work on the same principle, although the details of the arrangement differ considerably, as does the general appearance of the two devices. Their action depends on the dragging effect produced by a revolving magnet suitably arranged in the proximity of a pivoted copper ring or disc. As the magnet revolves, the disc, which is held by a fine spring, tends to follow it, thus pulling against the spring until the two effects neutralize one another, and the disc assumes a position of equilibrium. A pointer is, of course, attached to the copper member, and thus the speed of the car can be conveniently indicated. The Jones indicator is a simple mechanical instrument and operates on the ordinary centrifugal governor principle. The Cowey is also mechanical, but instead of employing a centrifugal governor it has an inertia governor in the form of a balanced wheel which receives impulses on its periphery from a reciprocating lever which is driven by the car. The faster the impulses, the more is the wheel thrown permanently out of balance, and being inter-



THE A.C.G.B.I. SPEEDOMETER TRIALS.—View of the Cowey Indicator with the bevel-wheel gear which drives it. This device acts on the principle of inertia, the drive being caused to transmit a series of impulses to the periphery of a balanced wheel. The faster these blows occur the more is the permanent deflection of the wheel to which the pointer is connected.



THE A.C.G.B.I. SPEEDOMETER TRIALS.—Views of the Warner Indicator and its driving mechanism. A small rotating magnet is contained in the instrument case and the moving dial is controlled by the torque induced by the magnetism acting in opposition to a fine spring which brings the reading back to zero when the car stops.

connected with a pointer, it is thus able to denote the speed of the car on a dial.

The Daily Record.

The following is a report that has been issued by the club giving the results of the runs made the first week:—

Thursday, March 1st, saw the first road run of these trials, when the three cars fitted, two of them with standard Collier tyres, and the third with an experimental beaded-edge tyre entered by the Collier Tyre Company, made the journey to Northleach and back *viâ* High Wycombe and Oxford. There was promise of rain when the start was made at 8 a.m., but nothing much came of it. The roads were, however, for the most part wet, and in places rather greasy. Parsons non-skids were therefore put on the 28-h.p. Daimler and the 20-h.p. Dennis, the 20-h.p. Rolls-Royce running without them.

At the foot of Dashwood Hill a halt was made to enable photographs to be taken of the cars. The climb, of course presented no difficulties, though the weight of the Daimler, with 5 passengers, is over two tons, and the journey was made without interruptions to Northleach and back to Witney, where the cars halted for luncheon.

The afternoon was also only remarkable for the way everything ran. There were no tyre troubles, the Dennis car, which is under observation, was unlucky to lose its "non-stop" record for the day, owing to a choked petrol filter; the Vulcan Speedometer had to be disconnected owing to a weak bracket; and the Metallic Mirror's tail light refused to burn owing to deficient air supply.

On Friday, the run was to Dunchurch and back, and this was marked by no untoward incidents to the various entries; tyres, lamps, speedometers and car all did their work correctly, with the exception of the Worsnop tail-light, which went out owing to vibration, and one of the Worsnop headlights, which got its feed-pipe choked in some way. On Saturday, the road was to Peterborough, when again tyres, car, speedometers and lamps came through successfully, with the exception that the Warner speedometer driving-gear required adjustment on the road, and one of the Worsnop headlights got choked again. The distance covered up to Saturday night was 495½ miles.

The Pradeau Spring Wheel.

ANOTHER resilient wheel has now come to the front, and is to make its *début* by a 4,000-mile trial on a Fiat car under the auspices of the club. At present we are unable to give any illustrated description, but we gather from the information provided that the wheel operates on the simple radial spring principle, the springs being accommodated in the extremities of the spokes. Lateral stability is apparently secured by the use of double rims, and the drive is evidently transmitted through hinged plungers—attached to the outer rim—which form the connecting links between the inner and outer rims, as well as being the direct means of operating upon the springs which are inside the spokes.

Gothenburg-Stockholm.

IN THE AUTOMOTOR JOURNAL for February 24th it was mentioned that E. Salmson, on a 24-h.p. Fiat, had covered the distance of 500 kiloms., in this trial, in a record time. The final awards are now announced by the A.C. of Sweden as follows:—

1. E. Salmson, 24-h.p. Fiat, 26h. 18m.
2. H. Dahn, 12-h.p. Darracq, 38h. 42m.
3. Bagge, 24-h.p. Star; 4. Petersen, 7-h.p. Oldsmobile.

An Open Hill Climb.

THE Southern Motor Club are organising an open event, which will take the form of a hill-climbing contest, to be held on April 7th.

A Tyre-Fitting Record.

2 MINS. 30⅖ secs. is a record for tyre-fitting, and has been accomplished, we learn, by the winner of the Tyre-Fitting Competition, held by the Continental Tyre Company at the recent Berlin Motor Exhibition. During this time a Continental motor cover and tube were taken off and replaced. The previous record was 5 mins. 45⅖ secs., made by the winner of the competition held by this Company at the Olympia Motor Show, 1904.

MOTOR BOATING.

Our Canals and Waterways.

A ROYAL COMMISSION has been appointed to inquire into the canals and inland navigations of the United Kingdom—as foreshadowed by the Prime Minister's programme in his Albert Hall speech.

The Commission will report on the following points:—

1. Their present condition and financial position.
2. The causes which have operated to prevent the carrying out of improvements by private enterprise, and whether such causes are removable by legislation.
3. Facilities, improvements, and extensions desirable in order to complete a system of through communication by water between centres of commercial, industrial, or agricultural importance, and between such centres and the sea.
4. The prospect of benefit to the trade of the country compatible with a reasonable return on the probable cost.
5. The expediency of canals being made or acquired by public bodies or trusts, and the methods by which funds for the purpose could be obtained and secured, and what should be the system of control and management of such bodies or trusts.

The following are the Royal Commissioners:—

Lord Shuttleworth, chairman, Lord Kenyon, Lord Brassey, K.C.B., Lord Farrer, Sir John Dorington, Bart., Sir John Brunner, Bart., M.P., Sir Francis Hopwood, K.C.B., C.M.G., Permanent Secretary of the Board of Trade, Messrs. W. J. Crossley, M.P., Russell Rea, M.P., J. F. Remnant, M.P., P. Snowden, M.P., Henry Vivian, M.P., L. A. Waldron, M.P., R. C. H. Davison, C.E., J. P. Griffith, C.E., J. C. Inglis, C.E., H. F. Killick, John Wilson, and Dr. A. J. Herbertson.

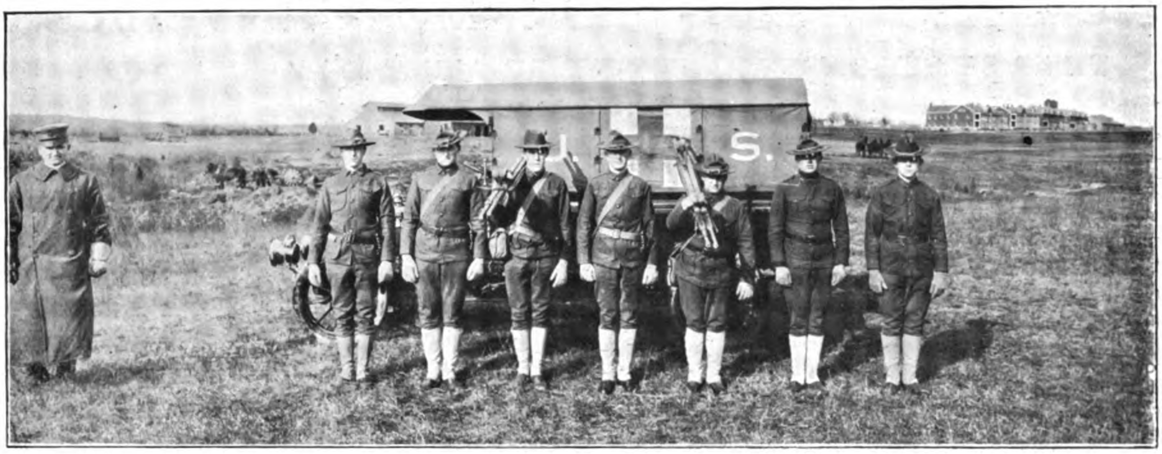
Mr. W. B. Duffield, M.A., barrister-at-law, will act as secretary.

Monaco Meeting.

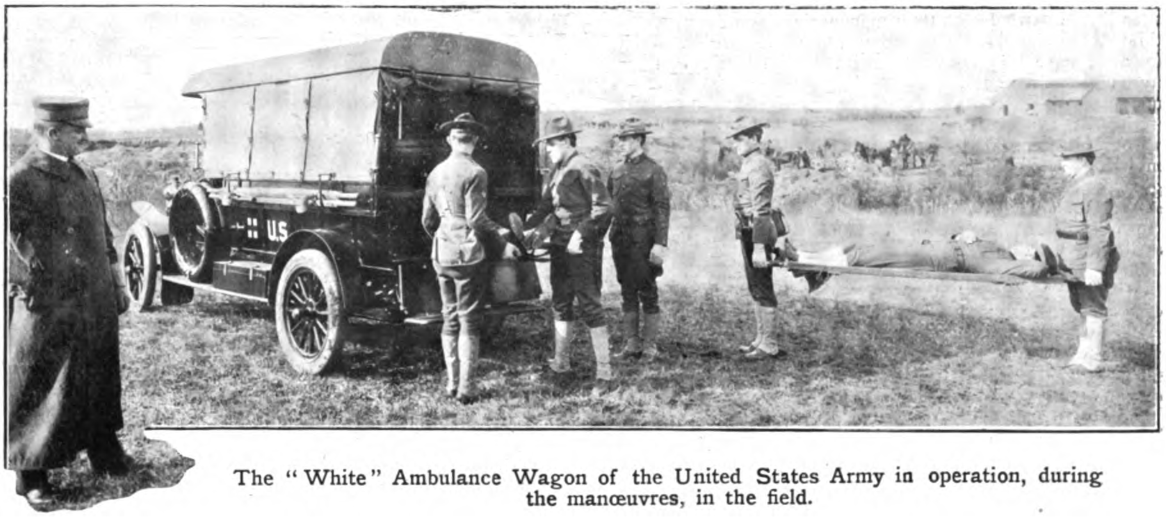
NINETY-FOUR boats—31 racers and 63 cruisers—have been entered to take part in this year's Monaco Motor Boat Meeting, April 1–15. These comprise boats of the following nationalities:—France 63, Italy 12, Great Britain 7, Switzerland 7, Germany 5. Of the British boats five are racers, viz.:—Mr. S. F. Edge's Yarrow-Napier, Mr. Mawdsley Brooke's Brooke I., Mr. J. E. Hutton's Hutton II., Mr. A. S. Cunliffe's Hutton-Saunders, and Mr. Lionel de Rothschild's Siola. British sport is represented in the cruiser class by our old friend, Takumono, owned by Mr. Miall Green, and the Daimler boat, Quicksilver, entered by Mr. J. M. Gorham. The French, German, and Italian entries include all the fastest craft known, built by each respective country.

Motor Fishing Boats.

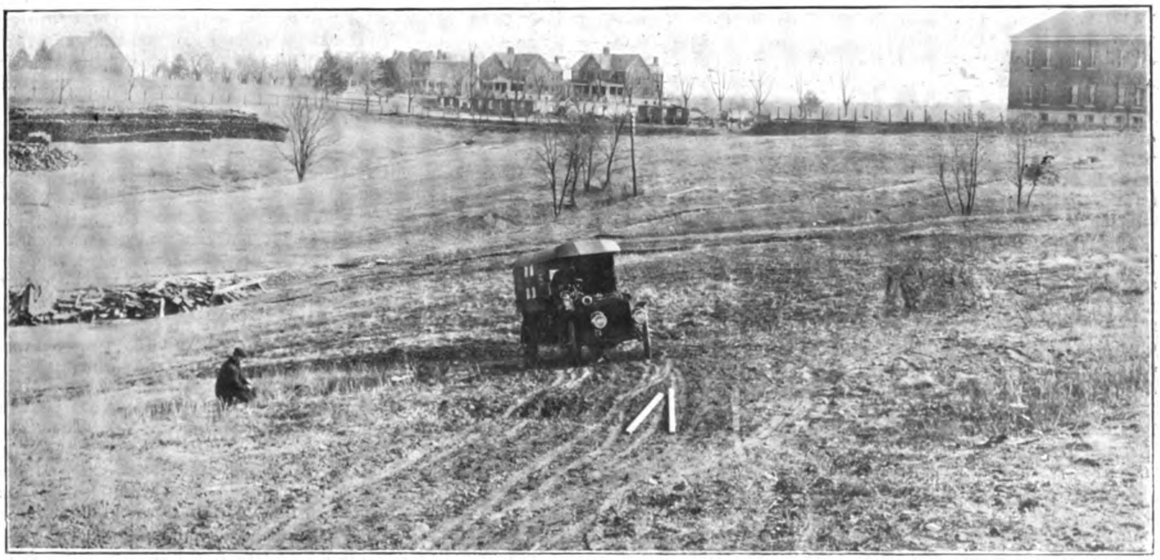
IN order to encourage the development of motors suitable for fishing boats, the French Yacht Club have offered a prize of 10,000 francs for a competition for fishing boats of the type used on the French coasts, in which an internal combustion motor is installed as an auxiliary. The contest is to take place at St. Malo, during the regatta, on August 25th to 28th.



THE MOTOR AMBULANCE IN THE UNITED STATES ARMY.—We recently gave a picture of a motor ambulance supplied by the White Steam Car Company to the United States Army. We are now enabled to supplement this by some other interesting photographs of the vehicle actually in operation. In the above picture, the squad in charge of the White ambulance is seen.



The "White" Ambulance Wagon of the United States Army in operation, during the manœuvres, in the field.



Testing the "White" Ambulance Wagon for hill-climbing by the United States Army officials, at Fort Mery, Virginia.

PNEUMATIC TYRES FOR MOTOR VEHICLES.

THEIR SELECTION, MANAGEMENT, REPAIR, AND MANUFACTURE.

By COLIN R. CROMBIE.

In this article, which is based upon a paper read recently before the Scottish Automobile Club (Eastern Section) at Edinburgh, Mr. Crombie deals with this very important subject in a manner which cannot but be of the greatest interest to all owners of cars, whether they are ardent motorists who drive their own vehicles or not. His acquaintance with the construction and management of tyres is essentially of a highly practical nature, and therefore his opinions will be read with great interest. His concluding description of tyre manufacture will also be welcomed, since it throws a particularly clear light on many vital points that are only partly understood by most motorists. Mr. Crombie, who is connected with the Victoria Rubber Company, Ltd., of Edinburgh, has had many years' experience in the rubber trade, and is consequently able to speak with authority as a manufacturer and an expert.

The question of the pneumatic tyre is always with us, and constantly affects our pockets—not infrequently our tempers also. The principle of the pneumatic tyre is a cover, to hold inside it compressed air, in what may be called a fluid state. This combination of rubber and compressed air has given such remarkable results that, where high speeds are required, the pneumatic tyre holds undisputed sway, and will, no doubt, continue to do so for many years to come. Nevertheless, it has its weak points, and certainly demands more careful treatment than any other form of tyre. Most of us know what we want, but there is no reasonable likelihood of our getting an absolutely perfect tyre, at all events, at present. Year by year great improvements are, however, being made in pneumatic tyres, and a little knowledge of their management and construction will, I think, often help some motorists out of difficulties, which would not arise were they conversant with certain details of their manufacture and maintenance.

My endeavour will be to try, as far as lies in my power, to explain the nature, capabilities, and construction of the pneumatic tyre, not so much from the tyre manufacturer's point of view, as in the light of the knowledge I have gained from my two years' experience of repairing covers and tubes, and also my twelve years' general experience in the rubber trade. If, in doing so, I can succeed to some little extent in smoothing the path of the motorist, the object of my remarks will have been accomplished.

Size and Life of Tyres.

Assuming that the motorist has selected a set of tyres of good repute, it rests with him to treat them with due consideration. No part of the car will repay attention so well as the tyres, and many a wearisome wait by the roadside can be avoided by getting the right tyres, and using them in the right way. The motorist will be well advised not to under-tyre a car. It is probable that a set of tyres costing, say, 50 per cent. more than the standard size of tyre supplied by the car manufacturer, will last twice as long. It is of great importance that the tyres should be of ample size and general strength, to support the required weight at high speed. Small light tyres spell frequent punctures and trouble, not to mention short life. Some motorists prefer to have light tyres on their front wheels, and heavy tyres, with square treads, on the back wheels. One disadvantage of this method of procedure is, that the convenience of interchangeability is lost, as square treads on the front wheels make steering considerably harder.

What they can, and can NOT Stand.

It must always be borne in mind that the tyres have very arduous and important work to perform, that they are more subject to injury and accident than any other portion of the car, and that they are, in fact, the protectors of the other parts of the car. They have to take the movement from the engine and carry out the vital act of propulsion. It should be remembered that the motion is given to the car by the friction of the rear tyres on the road. They must encounter every class of service, drive through dust that gives no grip, and wallow in mud till they find a solid bearing surface. The careless driver slews them about violently, drags them round corners in an excruciating way, and ever and again, to air his cleverness, he will apply his brakes so hard that the wheels lock and drag the tyres along the ground, doing immense damage to the covers. The same man will drive with his tyres imperfectly inflated, and so allow them to be rolled about most destructively on the rims. He will charge through patches of sharp stones, never taking the trouble to overhaul his tyres and mend those small cuts and gashes which allow the water to penetrate the tyre and so rot the canvas. This rotting of the canvas, which is a source of considerable anxiety to motorists, may, in most cases, be avoided if the holes are plugged in time. The canvas is more or less absorbent, and contains air. When a gash or puncture occurs in wet weather, the water enters at the holes, and by means of the capillary attraction of the canvas from within, and pressure from without, is gradually sucked and forced along between the fibres, carrying with it fine dust, mud, and grit, which disintegrate the layers of rubber and canvas, gradually sapping the strength of the cover until it finally bursts.

Correct Inflation Pressure.

The inflation of tyres to the proper pressure is a matter of great importance, and the neglect of this is a frequent source of damage. A large percentage of tyres sent in for repair show very evident signs of having been ridden under insufficient pressure. The following figures, compiled by one of the leading tyre manufacturers, give what appears to be a fair guide in the matter of pressure for various classes of tyres :—

	Front Tyre.	Back Tyre.
	lbs.	lbs.
2½ in. or 65 mm. to carry 450 lbs. per wheel	65	70
3 in. ,, 80 mm. ,, 500 lbs. ,,	70	75
3¼ in. ,, 85 mm. ,, 600 lbs. ,,	70	80
3½ in. ,, 90 mm. ,, 700 lbs. ,,	70	80
4 in. ,, 100 mm. ,, 1000 lbs. ,,	75	80
4¼ in. ,, 105 mm. ,, 1050 lbs. ,,	75	85
5 in. ,, 12c mm. ,, 1300 lbs. ,,	90	95
5½ in. ,, 135 mm. ,, 1400 lbs. ,,	95	100

The above figures refer, of course, to new tyres. Old tyres, or such as have been repaired, should obviously not be subjected to quite the same amount of pressure, and a little discretion should be exercised in inflating them. It will generally be found advisable to reduce the above pressure by a few lbs. in the case of such tyres.

Frequent Testing Recommended.

All tyres should be inflated with a pump to which a pressure gauge is attached, and ought to be tested at least every two days to see that the air is under its right compression. There is always a slight leak at the valve unless the fittings are perfect. It is a good thing occasionally to test the valve itself with a tumbler of water. If there be insufficient air, or none at all, in the tyre, then the cover gets jammed between the rim and the road, and if used in this state for any length of time becomes totally destroyed. The damage caused in this way consists in the cutting of the tyre at the bead, and also in the separation of the plies of canvas from one another. When this happens the tyre is beyond repair.

Outer Covers Damaged by Damp and by Strong Light.

Strong light and changes of temperature are two enemies of rubber. Light more particularly affects it and destroys its elasticity, which is its most important property. By too strong a light I mean chiefly the rays of the sun. On the surface of tyres which have been exposed to constant sunlight for any length of time, there appear small surface cracks, which gradually extend until the tyre is covered with them and becomes quite hard. The rubber on the tread will then grind away and it becomes necessary to have the tyre retreaded. To obviate this, rubber tyres should be stored in a dark place, but the main point is to prevent the direct rays of the sun from reaching them. Neither should the store room be damp, as this will rot the canvas. Covers and tubes should be wrapped in canvas, and put away in a dark store room, free from damp and of an even temperature. Though perfectly proof against water, rubber is easily affected by oils and acids, and if exposed to their action for any length of time, soon becomes decomposed. To avoid this risk of damage, always wipe off any oil or acid as soon as it is observed.

Replacing Inner Tubes.

Considering next the care of inner tubes, there are two kind of motor wheels at present in use, those with metal spokes and those with wooden ones. Special care is required in putting tyres on the former, as the spoke heads always project more or less through the rim, and are apt to damage the tube. To avoid this, a strip of canvas should be carefully cemented round the inner circles of the rim. It frequently happens that this strip is shifted to one side, thus allowing the projecting spoke heads to rub against and injure the tube. It often happens, too, that the tube is nipped between the badly fitting edge of the cover and the rim. The source of such accidents is hard to trace, and is generally attributed to a nail which can't be found. There are two different ways of nipping, either between the edge of the cover and the rim or between the edge of the cover and the security bolts. When the car is in motion, the tube in both cases is thus subjected to friction, which it cannot withstand for any length of time, and bursts with a loud report. The greatest care should be taken to place the tyre properly in the rim.

To avoid "Nipping."

The best way to ascertain whether the inner tube, after adjusting and before inflating, is in its proper place or not, is to push the security bolts back again through the rim and pull them outwards once more. If this can be done easily, it shows that the tube is in its right place; if, on the contrary, there is some resistance, it is a sign that something is wrong. The fault can easily be remedied by lifting slightly the edge of the cover and readjusting the tube. If these precautions are neglected, one runs the risk of having an accident on the road, and it is better to spend a little time at the start and see that everything is right. It not infrequently happens that the tube is nipped by the lever. When taking off or putting on a cover, special care should be taken not to push the lever too far underneath, as otherwise the tube may get under the lever and get nipped between it and the iron rims.

Faulty Valves.

In a great number of cases, the tube is found to be leaking in consequence of the valve being either faulty or improperly adjusted. The valve should be occasionally tested, and this is simply done by holding a glass of water up to it. If air is found to be passing some of the parts will require looking to.

(To be continued.)

* * * *

THE PROBLEM OF LONDON TRAFFIC.

THE following are a few of the more interesting and suggestive points and passages from the admirably thought out, carefully considered, and pithy paper read by Capt. G. S. C. Swinton, L.C.C., before the Society of Arts last week, to which we refer editorially in another column:—

London is suffering the penalty of over-popularity; how are we to cope with it?

We regretfully put on one side the oldest thoroughfare of all, the waters of the Thames, historic, free and open, unhampered by cross traffic, never in need of costly relaying. If the barrage scheme came to anything, if the 3,000 odd acres of river surface which traverses London from end to end, our greatest lung, almost comparable in size to all our parks and open spaces rolled into one, were converted from what it really is, a sheltered arm of the sea, into an inland lake, then it might be possible to use its waters for everyday trading purposes, even to run a continuous passenger service which could compete in speed and price with the more up-to-date methods on land.

Who, even a generation ago, would have thought of the incalculable value to us of our stratum of blue clay, or could have imagined that, in 1906, we should be told that the Underground Electric Railways Company was completing arrangements for dealing with nearly 600,000,000 of passengers annually over 100 miles of lines?

Private enterprise has sunk 16,000,000 sovereigns in order that we may move and move fast.

What are the requirements of the ideal thoroughfare? A good surface, the wider the better, easy gradients, no obstruction and therefore safety for all parties. It is a rare combination.

I have referred to the "over and under" method of dealing with cross traffic, and fortunately there is no longer any necessity to argue about the method being ideal. In teaching the lesson we have all of us learnt its difficulties. Mr. Fitzmaurice, the engineer of the London County Council, has laid it down that in his opinion an 18 ft. headway, a 2 ft. 6 in. superstructure, and a 1 in 30 gradient are all essential. These figures, on a dead-level road, make the approaches 200 yards long at either end.

After all is said and done, when we have cut London about to our hearts' content, what are the vehicles which are going to traverse our improved streets? On one point we have made up our minds. A revolution has taken place, and we have altered our standards of speed. The walking and trotting paces of a horse—four miles an hour and eight to twelve miles an hour—will suffice us no longer. To turn our attention first to public conveyances, we see that the horse omnibus is going the way of the horse tramway. What is to take its place? Will the travelling public of the future elect to be carried smoothly along the middle of certain roads on a fixed line of rails, or will it prefer a slightly rougher but more mobile service, which will take it in any direction and pick it up off the pavement at any point? Will the vehicles employed be dependent for their motive power on more definite street connection, or will they wander about the town relying each on its individual engine? At the moment it is impossible to say. It is, or it certainly should be, a question of which system gives the best all-round value to the community, which system will move fastest, cause least obstruction, and be the cheapest.

The motor omnibuses (I think it well to mention that I am not financially interested in them to the extent of one penny) are doing extraordinarily well, and earning large rewards; but it is early days for any certain estimate to be formed of their lasting, and so of their paying, capabilities. They are fast, and when well driven they minimise congestion. When in bad repair or badly driven they are noisy. The effect on the road surface, more especially of their great weight on pipes and connections beneath the surface, has been seriously questioned; but it is difficult to believe that the general tendency of their broad, rubber-shod wheels will not be to the advantage of all kinds of paving. We must remember that they are still in their infancy, and capable of very considerable improvement.

What, on the other hand, is the future of the street tramway? It is indisputably the most comfortable mode of progression, excellent in wide uncongested streets, but in heavy traffic it is obstructive, and quite unable to do itself justice and show its natural turn of speed. Many will say that it has arrived at its zenith, and that no improvements or cheapening can be looked for. And when we talk of cheapening, and come to the question of cost, what do we in London pay for our system? At present no one knows; but a return dealing with the expenditure on street widening and other incidental expenses along tramway routes which the Finance Committee of the County Council will shortly present, will, I think, be a revelation.

Surely all here will agree that, if the interests of general traffic are to be considered, no tramway should be permitted along any main thoroughfare unless there is to be 18 feet clear on either side. If, to get this width, for tramway purposes—I must emphasise these words—costly widenings and consequent repaving and other expenditure are required, that is tramway business, and the expense should be charged against the tramway enterprise.

Do you realise what horses cost London by the beat of their iron-shod hoofs, and the cleansing which their presence necessitates? In the City of Westminster there are 100 miles of streets, and the repaving, maintenance and cleansing, costs about £1,500 per mile annually.

When half the gentlemen of England are going into training as mechanics, the horse becomes a luxury for the rich. Fancy the advantage of no string of cabs taking up, the four-wheelers 120 sq. ft., and hansoms 90 sq. ft., in streets like Piccadilly, where a square foot of land is worth £20. For with a proper motor cab system, the stands would all be underground, a single specimen alone on the street level being replaced by lift from below the moment he was called off his stand. But the advantages to inner London of the disappearance of half its horses cannot be done justice to at this hour of the evening. Taking all motors together in the year ending December 31st, 1904, 5,023 were registered in London, including only four motor omnibuses. This, of course, being the first year, included all then running. To that number there were added last year 4,074, including 236 motor omnibuses. What will the figures be ten months hence? The disappearance of the horse would have one effect, it would add half as much again to the general speed of the town.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

MOTOR 'BUS RACING.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am glad to see your article on page 221 of your last issue, on the subject of motor 'bus racing. No doubt, on the face of it, this reprehensible practice is due to the sporting instincts of the drivers and conductors. If we only knew, books are probably made on the two events, the takings, and point to point. There may be further books made on donkey race lines—who carries fewest passengers—and maybe handicaps requiring an umpire's decision whether a corpse of a would-be passenger killed by 'bus nursing counts, if it can be proved that the corpse wished when alive to be a passenger.

A benefactor of mankind is he who can cause two blades of grass to grow where one grew before. Omnibus management, whether equine or mechanically tracted, is not run on these lines. The great principle seems to be—"Never mind about growing new blades of grass (new routes), but snatch your neighbour's blades of grass, whether full grown or only just above ground."

In vain have I written to motor 'bus companies urging upon them to start a route from near Waterloo Station, in the Waterloo or York Roads, to Sloane Street over Westminster Bridge. I am convinced there is a good motor 'bus route to be formed between Waterloo and Victoria Stations, bringing people to the House of Commons and all that neighbourhood, and to the countless offices in Westminster, and the Army and Navy Stores and to Victoria, to Sloane Street and to Harrod's Stores. In reply to these suggestions I receive platitudes about difficulties and inabilities to procure cars, &c. I have no doubt, however, that a good track could be developed on the routes suggested. At present, it seems more important to rival motor 'bus proprietors to prevent, say, "Vanguards" from carrying passengers than to earn dividends for their shareholders. This sort of thing generally leads to a clear out of those responsible when it occurs in a manufactory, trade or engineering business, and now that omnibuses are beginning to attract the clear heads of engineers into their directorate and construction, we may hope to see clearer-headed and cleaner business methods of management also adopted.

Faithfully yours,
"FOUNDER MEMBER 70."

Crankpin, London.

HISTORICAL MOTOR CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I find that Mr. Claude Johnson, from the reports of the paper read before the Society of Arts, has stated that he found the greatest difficulty in obtaining detailed information regarding the earlier cars, even from the manufacturers themselves. But Mr. Johnson, in referring to the commencing literature on the subject, would have found the earlier or pioneer petrol or petroleum vehicles clearly described, not only from the historical, but also, and chiefly, from the technical, point of view, in my paper on "Petroleum Motor Vehicles," read before the Society of Engineers, at the United Service Institution, Whitehall, in May, 1899. This paper not only describes but illustrates all the chief pioneer vehicles to that date, and up to this date Mr. Johnson could have found in this publication the required particulars. The paper describes and illustrates the first motor tricycle (Mr. Butler's); and the first motor car (my own), built in this country, and also the majority of the earlier cars and tricycles. Particulars are also given of the first automobile engine made and sold in this country, which was exhibited by me at the Stanley Show of 1894, and several of these engines were sold to French buyers, one to the Peugeot firm.

The meeting was attended by a large number, probably the majority, of engineers engaged in the industry at that time, and there was a very full discussion, which is printed with the paper. The paper was published by the Society of Engineers.

I have noticed that this paper has been frequently drawn upon by subsequent authors of papers and other publications, and generally without acknowledgment, so that I am not surprised that Mr. Johnson, not being an engineer (and the paper dealing chiefly with the technical side of the subject), was apparently not aware of its existence until I called his attention to it.

Yours faithfully,
I. D. ROOTS.

March 5th.

UNOFFICIAL COMPETITIONS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With reference to the challenge issued by Messrs. Mors, Limited, immediately after last year's Tourist Trophy Race, to run a reliability trial against the winning Arrol-Johnston car, we asked permission from the Automobile Club of Great Britain and Ireland to accept this challenge, but the Competitions Committee of the Club have refused their sanction.

Yours truly,
For THE NEW ARROL-JOHNSTON CAR COMPANY, LTD.,
W. S. MACLARG, Secretary.

MIS-USE OF THE FOOT BRAKE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We agree with Mr. Wellington that it is most important the foot brake should be used with great care, as every other portion of the mechanism of a car should be used, but I cannot agree that the purchase on the back brake is one-third greater as a rule than the purchase on the foot brake, insomuch as the foot brake works through a reducing gear of an average of about 3½ or 4 to 1, and, of course, increases the holding power of the foot brake in direct proportion.

The increase, of course, in a live axle car is obtained in the bevels, and in the chain-driven cars in the sprocket-wheels.

Yours faithfully,
J. W. BROOKE AND COMPANY, LIMITED,
March 2nd. MAWDSLEY BROOKE.

THE FLYING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In answer to Mr. J. D. Roots' letter, I was at one time of the same opinion as Mr. Roots, namely, that an aeroplane was too erratic and uncontrollable to ever become a safe and satisfactory means of aerial locomotion, but I continued my experiments with encouraging results and came to the conclusion that flying on the basis I advocate should be quite feasible.

I do not believe in placing too much reliance on models, but at the same time it must be admitted they are a guide to the solution, and if one cannot obtain satisfactory results with models, then there is little hope of success with full-size machines.

On the other hand, if it can be demonstrated that weighted models when thrown into the air, or liberated in any position from a height, on a windy day, will quickly right themselves and come gliding gently and safely to earth, then there are some grounds for believing it possible for larger machines to be equally stable in the air.

I find on throwing, or liberating in any position, several different models of my own type into the air, with or against the wind, they come down gently heading the wind. Also the moving of the weight either slightly forward or backward, to the right or to the left, has little effect. These are, in my opinion, very desirable features.

The above statements answer Mr. Roots' first and fourth objections to the aeroplane, as they prove, should the engine stop, or the machine come into a gust of wind, it would not capsize, but glide gently to the ground.

The other objections, *re* more convenient methods of starting, stopping, and the space required, &c., are matters which can be left to be overcome with the experience and knowledge gained when flying.

Yours faithfully,
A. V. ROE.

THE AUTOMOBILE ASSOCIATION AND ITS REVISED POLICY.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—For the coming season we are making important alterations and improvements in the *personnel* of the A.A. Cyclist Organisation.

To this end the men are being trained in tyre repairs—including the use of the Harvey-Frost portable vulcanizer, by favour of the proprietors of that invention. They will carry spare patching outfits, and where possible a light tow rope. Each cyclist will be well grounded in all local information as to the situation of repair shops, nearest garage, doctor, water supply, &c., in order that the corps' reputation as an important factor in the comfort and enjoyment of a week-end motor run shall be enhanced. The harmless and necessary patrol will be still harmless, but much more necessary.

It is only reasonable that with the added burden of the foregoing duties, it will not be practicable for our cyclists to render impartial help to all motorists. They will have quite enough to do to look after members of the Association; it follows, therefore, that, to borrow an expression used in theatrical circles: "On and after a given date, to be announced immediately, the Free List will be suspended."

Many motorists habitually enlist the services of our patrols without subscribing a single penny, and in a few instances they have actually written to the committee criticising our methods and offering superfluous and valueless suggestions. Non-subscribers must, therefore, not be annoyed when our patrols politely decline to assist them, because the refusal is made in obedience to instructions. It may be said, without giving offence, that for this decision the motoring dead-head has only himself to blame.

I beg the kindly hospitality of your columns for these few important particulars, and my committee wish to assure the motoring community that the new departures in no way affect the declared policy of the Association, inasmuch as the necessary restraint will still be exercised upon all and sundry offenders in respect of dangerous or inconsiderate speeding. Nor in this, our own programme of practical road supervision, do we encroach upon the work of any other and older organisation. The Automobile Association patrol will be an adjunct to and not a substitute for the local repair shops, and in addition to the experiments now being made with a device by which members of the Association will be made known to its servants, and about which a confidential circular will be issued to each member in due course, we are not forgetting to arrange that firms in the motor car industry shall enjoy the benefits of our work as freely as they are assisting us.

I am, sir,
Your obedient servant,
STENSON COOKE, Secretary,
The Automobile Association.

18, Fleet Street, E.C., March 6th.

FOUR-CYLINDER AND SIX-CYLINDER CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have read with interest the letter signed by Mr. J. Lambert in your last issue. If Mr. Lambert will carefully read my letter of February 19th, he will find that I did not express any opinion; I suggested then, and I suggest now, that it would be interesting to obtain the opinion of Herr Maybach, and other constructors, on 6-cylinder engines, whose opinions would be valued far more than those of Mr. Lambert or the writer of this letter.

Yours faithfully,
March 6th. W. M. LETTS.

BRITISH OUTPUT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I read with very much regret a letter by Mr. J. D. Siddeley in your last issue which appears to me to be written for the purpose of trying to prove that all British motor car manufacturers have deliberately made false statements as to their output except Mr. J. D. Siddeley himself.

The figures which I gave, namely, £484,000, as approximately the British output for the month of January, were obtained by personally writing to the principal firms in Great Britain, and with the exception of two or three firms, I received absolutely clear figures as to the number of cars manufactured in January, and the value.

Mr. Siddeley certainly did not give me the value or the number of his cars, but he told me the amount of his "weekly wages bill," as he says in his letter.

As I wished my figures to be exceedingly accurate, and not to err on the side of being too high, I had, curiously enough in Mr. Siddeley's case, taken the published figures of his company's output which have appeared week by week in the motor paper advertisements of his own firm last year, and understanding that since Mr. Austin left that the output of Mr. Siddeley's firm for motor cars has been somewhat reduced, I halved the value of cars that they were then selling, and the turnover I have shown is far below that which the number of men Mr. Siddeley says are employed could reasonably be expected to turn out.

It was exceedingly kind of Mr. Siddeley to be so frank with me in regard to the number of workmen his firm are employing, and the wages they are paying, and when he wrote me this letter I can only assume by the letter he has now written to the paper that he had hoped that I should be misled by the large figures sent, and imagined that I would think these men were fully employed making nothing but motor cars. If, however, Mr. Siddeley thinks that I have over-estimated the output of his factory by taking it at half what it was eighteen months ago, then undoubtedly my figures are wrong. Perhaps Mr. Siddeley would say how much more his firm's business has depreciated since he took charge, and I will reduce my figures accordingly.

Yours truly,
March 2nd. S. F. EDGE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Mr. Edge wrote to us in a similar way that he appears to have written Mr. Siddeley, and was supplied by us with every possible information to enable him to formulate statistics which might prove, and in our opinion have proved, of inestimable value to the British motor industry.

We presume that there are other firms who have endeavoured to help Mr. Edge in a similar manner, and thus enabled him to get figures together sufficient to justify his statements. Probably if everyone had been as helpful as Mr. Siddeley was, the statement would never had been made at all, to the disadvantage of the British industry.

Yours faithfully,
J. W. BROOKE AND COMPANY, LIMITED,
MAWDSLEY BROOKE.

March 2nd.

THE QUESTION OF GUARANTEE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Mr. S. F. Edge, with his usual ability for making himself prominent, has been suggesting that the British motor car trade, for the purposes of combating the foreign industry, should give a three years' guarantee, and suggests that his brother British manufacturers should do the same.

In view of the difference in price charged by Mr. Edge for his goods, and those charged by other of his British and foreign competitors, I would suggest that the proposition is a bad one coming from him; and I would equally suggest that before he makes such propositions, he should first consider the advisability (for the benefit of the British industry) of bringing his prices down to the level of other makers and in proportion thereto.

To make my letter as short as possible, I give you herewith under a list of cars with their respective bores and strokes, their cubical inch contents, their brake horse-power calculated at 10 cubic inch for one b.h.p. (which is a good maximum efficiency), the price of each vehicle, and the price per b.h.p. :—

40-h.p. Napier, 4 × 4 (6 cylinders) = 300 cubic inch contents or 30 b.h.p. Price £1,250 = £41·50 per h.p.
30-h.p. Maudslay, 4½ × 4 (6 cylinders) = 380 cubic inch contents or 38 b.h.p. Price £825 = £22·75 per b.h.p.
24-h.p. Fiat, 125 × 150 (4 cylinders) = 450 cubic inch contents or 45 b.h.p. Price £720 = £16 per b.h.p.
32-h.p. Siddeley, 5¼ × 5 (4 cylinders) = 430 cubic inch contents or 43 b.h.p. Price £775 = £18 per b.h.p.
35-h.p. Daimler, 134 × 150 (4 cylinders) = 520 cubic inch contents or 52 b.h.p. Price £990 = £19 per b.h.p.
24-h.p. Itala, 130 × 140 (4 cylinders) = 460 cubic inch contents or 46 b.h.p. Price £850 = £18·40 b.h.p.
40-h.p. De Dietrich, 130 × 160 (4 cylinders) = 510 cubic inch contents or 51 b.h.p. Price £1,100 = £21·50 per b.h.p.

In comparison with each and every of the makers above quoted Mr. Edge's car works out as follows :—

In comparison with the Maudslay, he should charge £825 for his chassis, or in comparison he is £570 too dear.

In comparison with the Fiat, he should charge £480 for his chassis, or he is £770 too dear.

In comparison with the Siddeley, he should charge £540, or he is £710 too dear.

In comparison with the Daimler, he should charge £770, or he is £680 too dear.

In comparison with the Itala, he should charge £550, or he is £700 too dear.

In comparison with the De Dietrich, he should charge £645, or he is £700 too dear.

Further comment is needless. Mr. Edge can give three, four and five years' guarantee and even then he is dearer than his competitors, and I repeat it does not come well from him to suggest that his competitors who are so much cheaper should give such lengthy guarantees.

I have every pleasure in enclosing you a copy of this letter to each of the firms whose names I have taken the liberty of mentioning, and trust that you will find space for my letter in defence of both British and foreign manufacturers.

I am,
Faithfully yours,
March 2nd. D. M. WEIGEL.

CLUBS AND ASSOCIATIONS.

A.C.G.B.I.

FOLLOWING the house dinner, a smoking concert was announced to be held at the Automobile Club on Thursday evening of this week, at 9 o'clock, and amongst those who were down to take part in the programme were: Mr. Paul Rubens, Mr. L. Grossmith, Mr. Maurice Harvey, Mr. John Bromley, Mr. Arthur Helmore, Mr. Charles Pond, Mr. Fred Russell, Mr. Louis Roche, Mr. Charles Collette, Mr. Walter Walters.

British Motor Boat Club.

THE annual general meeting of this club was held at the headquarters, Craven Hotel, Charing Cross, on Tuesday last week.

The officers for the ensuing year were appointed as follows:—*Commodore*, Admiral Sir William Kennedy, K.C.B.; *Vice-Commodore*, the Marquis of Ailsa; *Rear-Commodore*, Mr. W. Miall Green. The committee consists of the following gentlemen: Viscount Royston, Lieut. W. Windham, R.N., Lieut. H. G. Vereker, R.N., Messrs. R. Haden Tebb, R. Denys Dundas, W. Lawrance, Ernest Owers, L. Stroud, A. G. Fentiman, F. Simms, Seaton Edge, Charles Jarrott, Mawdsley Brooke, L. Miles, A. Kenealy, C. Cordingley, G. de Holden Stone, E. Kenealy, A. Harden, H. T. Arnott, G. Neill, J. S. Holmes, F. C. Blake, N. B. Kenealy, F. B. East, Oswald B. Colls, A. Lee Guiness.

It was decided to form branches and affiliated branches in various parts of the United Kingdom.

The statement of accounts showed the club to be in a healthy condition.

On the 14th inst., a paper, written by Mr. G. de Holden Stone on "The Requirements of Marine Motors in Design and Construction," will be read at the head-quarters of the club, following the usual house dinner.

East Surrey A.C.

MAJOR KINGSLEY O. FOSTER, J.P., the President of the Club, occupied the chair at the general meeting of this club, which took place last week, when a very satisfactory showing was made in the accounts for the year, there being a balance of more than double that of the previous corresponding period. The chief business, besides the passing of the report, was the election of officers, which resulted in Capt. Rawson being selected as president for the ensuing year, and the other officers as follows: *Vice-Presidents*—Sir A. Rendel, Sir G. Livesey, C.E., Major Kingsley O. Foster, J.P., Mr. H. Bell, Mr. H. M. Corsellis, and Mr. J. B. Purchase. *Committee*—Messrs. G. H. Bowden, N. Colman, W. F. Garside, H. Hughes, A. Gunning Keen, H. Rosling, J. Underhill, C. H. Whittington, and J. Whittington. *Hon. Secretary and Treasurer*—Mr. D. J. Barry.

Marine Motor Association.

A MEETING of the council of the Marine Motor Association was held March 1st, among those present being Messrs. Linton Hope, chairman, Alfred Harden, W. Miall Green, A. Vaughan Williams, Seaton Edge, and J. A. Smith, assistant secretary.

The principal business before the meeting was the settling of the agenda for the spring general meeting, the date of which has been fixed for the 22nd inst. The new rule requiring all motor launches to be fitted with exhaust silencers came up for discussion, and the whole question will be reconsidered at the general meeting.

It was a matter for great regret that Major Lloyd has been compelled to retire from the presidency of the Association on account of ill-health. Major Lloyd has held the office of president for upwards of two years, and has been an indefatigable worker in the interests of the Association.

The new rule books of the M.M.A. are now ready, and copies may be obtained from the assistant secretary, Mr. James A. Smith, 47, Leadenhall Street, E.C., at a charge to non-members of 6*d*. per copy.

Motor Union.

AT the last meeting of the general committee of the Motor Union, the following were elected to life membership:—Messrs. Charles H. Sample, Corbridge-on-Tyne; Norman Barker, Bowdon, Cheshire; Edward T. King, Pulborough, Sussex; R. Jackson, M.B., St. Helens; W. Marden, Surbiton; James Cooper, Scarborough; John Kennedy, J.P., D.L., London.

Mr. Arthur Du Cros, on behalf of the Dunlop Pneumatic Tyre Company, Limited, has forwarded a cheque for fifty guineas as a contribution to the Legislative Defence Fund of the Motor Union.

Motor Yacht Club.

THE first annual general meeting of the club (late Marine Motor Club) was held at 119, Piccadilly last week, Sir Boverton Redwood, the Vice-Commodore, presiding. The report outlined a satisfactory state of affairs, whilst the financial statement showed a surplus on the year of over £600. In the report, the Committee explained that the club was founded by the A.C.G.B.I. in June, 1905, to take over the duties of the Marine Motor Committee, elected by that body in December, 1902, to promote the interest of motoring in the water. The membership of the club now totals to 150, and it was announced that a challenge had been received from America for the International Cup, won on September 11th last at Arcachon, by Lord Montagu, then the Hon. John Scott Montagu, M.P., with Napier II., owned by Lord Montagu and Mr. Lionel de Rothschild.

Sir Boverton Redwood congratulated the club upon the past year's work, and he thought that no club had a better chance to develop into a first-class organisation. It was now well established with a sound financial position, and the future history of the club was in the members' own hands. They had to thank the liberality and generosity of the rear commodore, Commander Mansfield Cumming, R.N., for the magnificent floating club-house in the ex-Admiralty yacht "Enchantress." In regard to this floating club-house, it was explained that a large number of state rooms were being arranged, and that there would be adequate accommodation on the yacht for about 1,000 people without overcrowding. The new club-house would be ready for occupation about May 1st next.

The report and accounts were unanimously adopted.

The Society of Motor Manufacturers and Traders.

GREAT activity prevailed last week amongst the committees of the various sections of the society. On Monday the committee of the Commercial Vehicle Section met, when the issue of the police regulations *re* motor 'buses was reported, and complete satisfaction was expressed at the result attained through the joint efforts of the makers and users, which had been conducted by the society, and a vote of thanks was passed to the delegates who had served on the deputation to the Chief Commissioner.

On Tuesday the new Tyre and Accessories Section held their first meeting, when Mr. W. G. Williams, of the Collier Tyre Company, was elected chairman. A number of matters of interest to the section was discussed, including the important matter of infringements of registered articles, in which there is now a considerable illicit trade, and a recommendation was made to the committee of management, which may result in serious proceedings being taken.

On Friday the committee of management met. A sum of ten guineas was voted to the Auto-Cycle Club towards their expenses in challenging for the International Motor Cycle Race. A deputation was received from the Importers' Protection Association, and it was resolved to call an early meeting of the committee for the purpose of defining a policy which would meet the requirements put forward by this association, and by the British Empire Motor Trades Alliance.

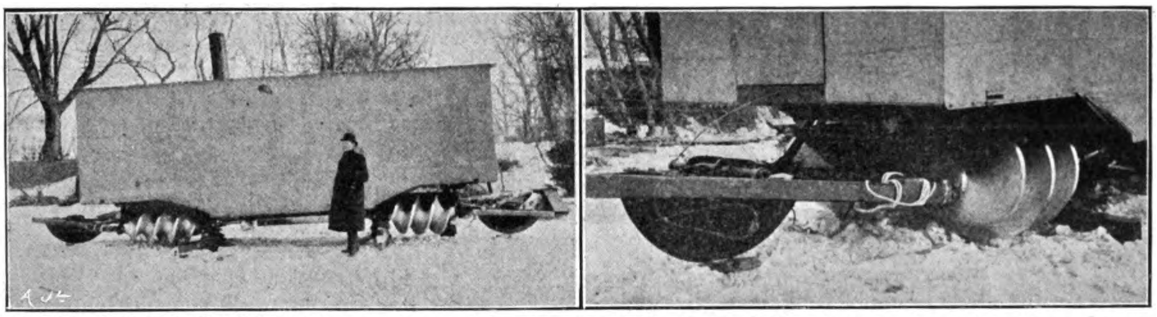
MOTOR CYCLING.

Land's End to John-o-Groats Trial.

FOURTEEN entries for the Auto Cycle Club long distance trial have, up to the present, been announced. We would remind those who contemplate entering that it is dangerous to delay, as the Committee of the Club have the right to limit entries.

Motor Bicycle Championship.

FOLLOWING the protest of the Austrian Automobile Club, to which attention has been drawn in THE AUTOMOTOR JOURNAL, in regard to the International Cup of the Moto Cycle Club of France, the French Club have now reconsidered the position, and announce that they have determined that their new motor bicycle *International* Championship shall no longer be international but shall be open to French makers only. They cannot, however, see their way to alter the date to one subsequent to that of the International Cup. The French motor bicycle events will therefore take place, as already announced by us, on May 27th and June 10th, whilst the original "International Cup," in which France will only be represented by one small and unknown maker, viz., the Gillet firm, will be run, as originally fixed, in Austria, with most of its glory unfortunately shorn by the action of the French Club. The French Moto Club explain very politely that they have never had any wish to in any way detract from the International Race which they originally created, but there are those in the motor cycle world who will remain of the opinion that their expressed wishes might have been demonstrated in a different form than that adopted, viz., of creating new events in France and practically thereby ostracising the "International Cup," simply because they had the misfortune not to win it last year.



AN ICE LOCOMOTIVE.—Views of a machine by which Mr. C. E. S. Burch hopes to replace the sleigh dogs of Alaska in the transport of goods over the ice during winter time. Our photographs, which are by the "Scientific American," show the propellers which replace the wheels, and also the peculiar semi-disc rudders.

AN ICE LOCOMOTIVE.

Few systems of transport remain uncontested by the automobile, and now even the sleigh dogs of Alaska are about to feel the brunt of competition. During the winter months there is a goods transport service which is at present conducted entirely by dog haulage. Recently, however, Mr. C. E. S. Burch—who is personally interested in the transport of the district—has designed an ice locomotive, which he proposes to use instead of the dogs.

This machine is built on very original lines. It has four large spiral "propellers" in place of wheels, and each is coupled direct to a steam engine. The screws are 27 ins. diameter, the engines develop 42 h.p., the overall length of the machine is 22 ft., and its weight 4½ tons.

Steering is effected by means of semi-disc rudders, and the locomotive can, says the *Scientific American*, to which we are indebted for our facts, "be driven forwards, backward, sideways, or at any oblique angle desired, and it can even be made to spin round like a top." Nothing is said as to whether some of these latter capabilities were not found to be inherent and apt to choose their own occasion for demonstrating their presence; but the top-like propensities, at any rate, have no very obvious utility, even if quite under control.

We understand that a speed of 18 miles per hour was attained on the trial run, and that obstacles caused no appreciable interruption to its progress. One useful precaution is that the locomotive is made water-tight with a view to unexpected immersion. Propellers 6 ft. in diameter are used on the new machine, and these would doubtless be very useful in such an emergency by helping this amphibious and snake-like vehicle to regain its favourite element.

Testing the ordinary Automobile on Snowy Roads.

Under certain circumstances, however, it is possible to accomplish a good deal with the ordinary automobile on snowy roads, at any rate where tracks have been made by sledges. This is at least the experience of Lieut. de la Besse, of the Briançon Garrison, who has been carrying out a number of tests with an ordinary motor car in the French Alps. On the sleigh-tracks referred to, he finds that the adherence of the ordinary pneumatic tyre is remarkable. To all who have noticed, in countries where the sleigh is an institution in winter, how exceedingly slippery the tracks become, Lieut. de la Besse's conclusions will come as something of a surprise. In the neighbourhood of Grenoble and Briançon, Lieut. de la Besse drove a 14-h.p. machine, with ordinary pneumatic tyres, up to altitudes of 1,200 metres, on a very considerable gradient, amounting in some cases to 10 per cent., and these long stretches were ascended on the sleigh tracks without the slightest difficulty. Where fresh snow was encountered, which had not been beaten down by sledges, things were different altogether, and the automobile became unmanageable.

Another Snow Motor.

Mr. Walter Wellman, of whose intention to reach the North Pole by navigable balloon nearly everybody is aware, has adopted a method of tackling the snow and ice with an automobile, which, though less original than the entertaining machine we illustrate above, may probably give just as good results. The weight of the car is taken on runners like an ordinary sledge, and the propulsion and grip of the driving wheels is increased by arming them with spikes. We conclude that Mr. Wellman intends to use his motor sleighs principally for establishing depôts in advance along the direction he intends ultimately to take by air-ship.

The Automobile in Argentina.

It is affirmed on good authority that there are at present 1,200 automobiles in Buenos Ayres alone. High speeds are not possible owing to the character of the roads of the Republic, but at the same time some good sporting events have already been run off, whilst others are announced for the near future by the Argentine Automobile Club, in which, however, the total distances do not range much beyond 200 kilometres.

* * * *

PUBLICATIONS RECEIVED.

Motor Vehicles and Motors. Second volume. By W. Worby Beaumont. London: Constable and Company. Price, 42*s.* net.

The Happy Motorist. By Filson Young. London: E. Grant Richards, 7, Carlton Street, W. Price, 3*s.* 6*d.* net.

Notes to Drivers. Chelmsford: Clarkson, Limited.

Injectors: Their Theory, Construction and Working. By W. W. Pullen, Wh.Sc., &c. Manchester: The Technical Publishing Company, 287, Deansgate.

Motoring Annual for 1906. *Motoring Illustrated*, 11, Arundel Street, London, W.C. 5*s.*

Catalogues.

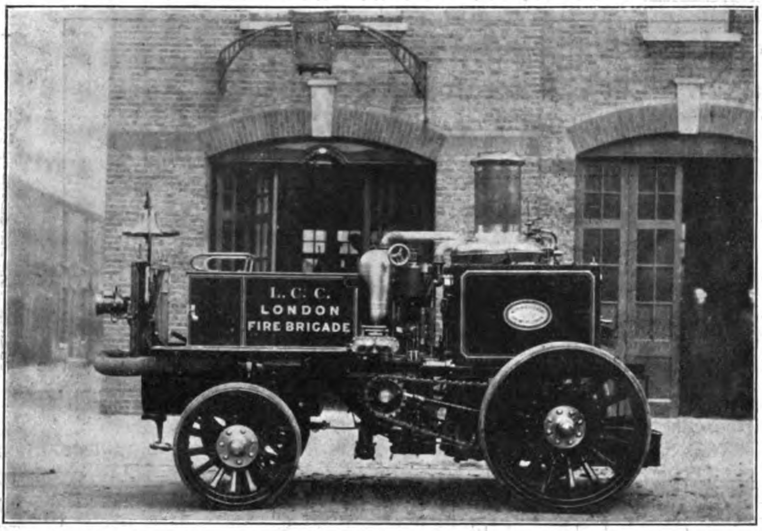
Humber Cycles and Motors, 1906. Humber, Limited, Beeston, Notts.

De Dion Bouton Expanding Clutch Gears. De Dion Bouton, Limited. 10, Great Marlborough Street, W.

Artillery Motor Wheels, Motor Axles; Springs, &c. Smith, Parfrey and Company, Limited, Fulham Palace Road, Hammersmith.

Wheels, &c., 1906. Smith, Parfrey and Company, Limited, Fulham Palace Road, Hammersmith.

Iris: 1906. Legros and Knowles, Cumberland Park, Willesden Junction.



The Motor Fire Engine that did not run amok.—Last week a paragraph was published in the daily papers purporting to describe the running amok of the new motor fire engine stationed at Wapping. As usual the affair was greatly exaggerated, as not only was the fire engine uninjured, but it went on its way, attended the fire, and was soon back standing in its station, with 100 lbs. of steam in the boiler ready for an instant turn-out. What actually happened was that, on its way to a fire, it touched the corner of a fruit stall standing by the kerb, causing the stall to overturn, knocking down the proprietor. Some of the woodwork smashed a shop window, but no further damage was done. We give a photograph above of this fine machine, which, it will be remembered, is by Merryweather and Company.

The "Competitions" Committee.

THE A.C.G.B.I. "Races Committee" is, for the future, to be known under the above title.

Stanley Show, 1906.

WE learn from Mr. E. A. Lamb, the Secretary of the Stanley Show, that their Exhibition this year will be held at the Royal Agricultural Hall from November 23rd to December 1st.

Sheffield Secures the Brotherhood-Crocker Factory.

WE hear that the head-quarters of the Brotherhood-Crocker Motor Company are to be established at Sheffield, for which purpose a tract of land has already been secured at Tinsley, where, as soon as arrangements will permit, the Brotherhood car will be manufactured.

Some People Never Learn.

A MOTOR car took fire a short time ago in Kingstown, near Dublin, a leak of petrol being apparently the cause. The inhabitants seemed quite surprised to find that throwing water on it only made matters worse! It was left to the simple intelligence of policemen to finally extinguish the conflagration with wet sacks.

Cheshire Motor 'Bus Service.

A NEW service of motor omnibuses is to be run over the roads of Cheshire and Derbyshire, serving the villages not reached by electric tramways. These are to be put on the road by the Manchester and District Motor Omnibus Company, Limited, the share capital of which has this week been offered for public subscription. An experimental service was started last week, in the Manchester district, between Hale and Flixton, and 150 vehicles are mentioned as likely to be running in the service of the Company in the near future.

Casting Stones at a Motorist.

SOME small boys on the Hammersmith Road recently armed themselves with stones, and one of them took a shot at the passing motor car of Lieut. Cecil Whittaker, of the Coldstream Guards. The missile hit Lieut. Whittaker in the eye. He at once pulled up the car and chased the young rascals up an alley, where he captured the one who had discharged the missile. The boy made a subsequent appearance at West London Police Court, and was fined fifteen shillings with the alternative of ten days' hard labour. On the whole, we are satisfied with the progress displayed. Three years ago it was the cudgel of the Ripley butcher; from that to the pebble of the street urchin represents a great advance in popular favour.

The Agricultural Hall Exhibition.

ALREADY nearly 300 exhibitors have, we learn, been allotted space at the Exhibition at the Agricultural Hall, which opens on Saturday, March 24th, and will continue until the 31st. Several new 1906 cars will be shown for the first time, whilst, supplementary to the light car section, the show of heavy vehicles, including lurries, 'buses, and municipal vans, will have a wide range, affording further conclusive evidence of the growth of this branch of the industry. During the week of the Exhibition several Automobile Societies will hold meetings and conferences of considerable importance to the movement. The organisations thus associated with the Exhibition include the Motor Union, the Automobile Mutual Protection Association, the Ladies' A.C., the Motor Van and Wagon Users' Association, the Automobile Association, and the British Motor Boat Club, as well as the Municipal Surveyor and other Societies interested in matters of local government.

Sheffield Motor Show.

DURING the week the Sheffield Motor Exhibition has proved a big success, following the opening last week end by the Lord Mayor of Sheffield, Col. Hughes, C.M.G. The Exhibition, which has been run under the auspices of the Sheffield A.C., was fully representative of pleasure cars, vehicles for trade purposes, and accessories, and must have proved a considerable convenience to many who found it impossible to visit the London Show at Olympia last November.

The Lord Mayor, when opening the Exhibition, gave forth some very strong views in regard to the sport and industry. Experience, he said, had taught him that motor cars could be used without inconvenience or danger to the public if only care was exercised by those driving them. He did not consider that it mattered a bit if the speed was 30 or 40 miles an hour so long as they had a clear road and no traffic. He was convinced that the feeling against motor cars, which now seemed to be dying away, was simply due to those drivers who did not pay attention to the traffic when they were passing it. Once drivers paid regard to the nature of the traffic they were passing, he was sure there would be little further cause for reproach.

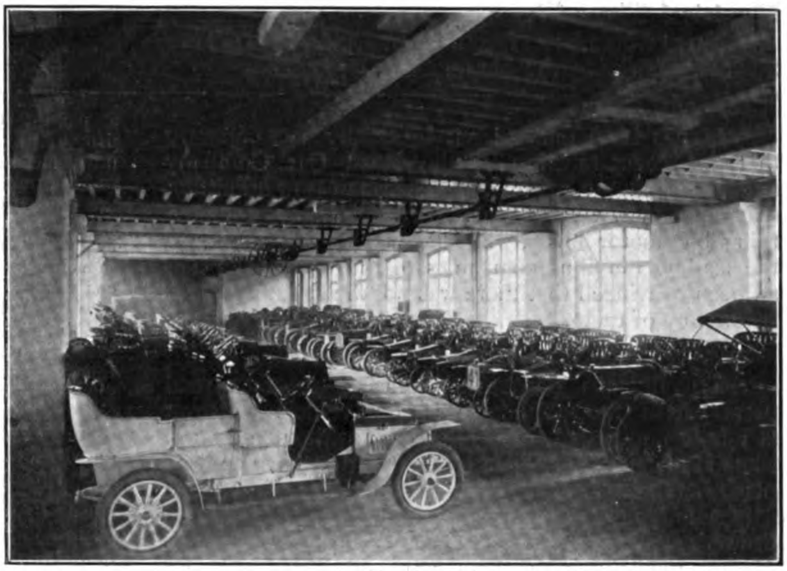


Photo by G. A. Dunn.

Recently it was announced in "The Automotor Journal" that Messrs. Darracq and Company had acquired very extensive property in Walnut Tree Walk, Kennington, for the purpose of establishing large central show rooms and a depot for the housing, repairing, and distribution of the Company's output. These premises are now coming into operation, our photograph showing one of the stock rooms "charged"; the three floors have an area of 250,000 square feet. Already eight houses and gardens adjoining the existing premises have been purchased and will be pulled down to make room for offices and showrooms. The centre of the block will form a large testing track, nearly an acre in extent, concreted and covered with a glass roof, lit by arc lamps.

Mr. E. H. Lancaster.

Innate commercial instinct combined with sound grounding in engineering, are responsible for the very rapid advance which Mr. E. H. Lancaster has made in the course of the few years in which he has been associated with the automobile industry. It seems only yesterday that he was known to most of us as the Automobile Club engineer, since which he has somehow found time to establish the Clement car upon a firm commercial footing in this country, having acted as managing director of the company exploiting this well-known make of vehicle. Mr. Lancaster has now made a further important move upwards by accepting the position of managing director of the New Enfield Autocar Company, which has just been formed for the purpose of taking over the automobile section of the business of the Enfield Cycle Company, a point which was last week mentioned in The Automotor Journal. Under his guidance the new company should, without doubt, have a big future before it, and the manufacture of this "all-British" production will be under the direct supervision of Mr. Lancaster. Mr. Lancaster is well fitted as a practical man for the post which he has now taken up, his experience in the past having been of a very varied character. Originally he was apprenticed to the Edison Continental Company, where he served for four years in their tool shop, passing from there to Messrs. Easton and Anderson, the electrical and hydraulic engineers, of Erith, with whom he remained for several years. He then came into more direct contact with motor cars at the Panhard and Levassor works, in Paris, for two years, becoming during this period the assistant of M. Cabirau, the consulting engineer to M. Camille Blanc, of Monte Carlo fame. Mr. Lancaster left M. Blanc to go to Lord Northcliffe (then Mr. Alfred Harmsworth), with whom he stayed three years, and during this period he brought over Mr. Harmsworth's 40-h.p. Mercedes to England, exhibiting it at Messrs. Cordingley's Show in 1901, where, it will be remembered, this car created a phenomenal amount of interest. It was upon leaving Mr. Harmsworth that Mr. Lancaster became the engineer to the Automobile Club, subsequently taking over, as already mentioned, the handling of the Clement car in this country. We wish Mr. Lancaster every success in his new sphere.

Mr. E. H. Lancaster.

"Motor Trade with Canada."

At the Automobile Club, on Thursday of last week, when Mr. H. Austin took the chair, the paper read by Mr. E. H. Turnbull, under the above heading, was chiefly directed towards interesting British manufacturers in the possibilities of Canada as a good market for their cars. He urged them to lose no time in establishing themselves in the Dominion, and pointed out that the preferential duty in favour of British cars ought to be a particularly strong inducement to them. In his opinion, no less than a thousand cars could be sold there this year, and ten times as many during next year. Next month automobile exhibitions are being held both in Toronto (April 7th to 14th) and in Montreal (April 21st to 28th), and Mr. Turnbull has been doing his best to persuade British firms to show their cars at both of them. Apparently the Humber Company are alone in having a Canadian agency at present, and they have sold no less than twenty-six cars since October last, when they opened that business.

Motor 'Buses to Help Tramways.

The promised motor omnibus service at Bath for the hilly Lansdown district, Widcombe and Bathampton, has been inaugurated by the Bath Electric Tramway Company.

Municipal Motor 'Buses.

MOTOR omnibuses are to be put into service in the Sneinton district by the Nottingham Corporation.

Then, and Now!

IT has been pointed out by a daily contemporary that the recent meeting of the Road Car Company makes very funny reading, the chairman now admitting that he did not think there was any chance for anything but motor 'buses, while not such a long time ago the leading omnibus companies of the Metropolis had all been convinced that there was not the slightest future before any of them.

The Unlighted Vehicle Danger.

THE hideous dangers that arise to other road users where the attendant of any vehicle whatever is idiotic enough to drive after dark without a light of some kind, was exemplified by an occurrence which took place in December last near Itchen Abbas, when Mr. Michael Malloy ran into the back of an unlighted brewer's van and injured his horse and trap. Mr. Malloy recently brought an action at Winchester for damages, and his Honour, Judge Guy, who tried the case, made some very strong remarks indeed on the dangers of the unlighted vehicle, stating it as his view that the defendants, *i.e.*, the brewer and his men, were "guilty of the grossest possible negligence. It amouted in fact to a total and reckless disregard of danger to life which might cause endless trouble and calamity." "It was bad enough," he said, "when people ran risks which affected only their own pockets and personal danger, but when, to save a few paltry shillings, they ran risks which might inflict a lifelong injury on others, it was really past belief that such things could be done. Driving at night without proper care as to lights was a matter of common complaint, but when they saw people who ought to know better doing this sort of thing, it was a serious matter, and he would draw the attention of the borough county constables to these circumstances, and particularly to this accident." These well-founded remarks of the learned Judge should have the effect of inducing a few of the remaining County Councils who have not yet got them at once to introduce bye-laws on the subject, and his remarks also should certainly have the effect of strengthening the hands of those in Parliament who are in charge of the Universal Lighting Bill.

COMPANY DOINGS.

NEW ISSUES.

Enfield Autocar Company, Ltd.—Subscriptions are invited at par for 100,000 shares of £1 each in the Enfield Autocar Company, Ltd. The Company has been formed in particular, the prospectus states, for the purpose of purchasing, as a going concern, and of carrying on and extending the manufacture and business of the autocar department of the Enfield Cycle Company, Ltd. The vendor company has for some time past been engaged in the manufacture and sale of motor cars, and has expended very considerable sums upon the production of a first-class motor vehicle. In consequence of the greatly increased trade in the cycle department and the anticipated large development of the motor car business, the works of the vendor company are not of sufficient capacity for the efficient and proper conduct of the two businesses, and it has therefore been deemed necessary to separate them. The present issue of 100,000 shares is intended to provide a sum sufficient for the following objects:—For the purchase of the freehold works, motive power, plant, machinery, stock, drawings, patterns, &c., £31,163; for extension of buildings made since January 1st, 1906, £1,517; for additional machinery, £10,000; for estimated expenses of formation of the company, £2,500; and for working capital, £54,820. It is the intention of the vendor company to apply for 15,000 shares, and the directors and officers of the vendor company will apply for at least 8,000 shares. The directors, all successful business men, are Mr. Albert Eadie, Managing Director of the Eadie Manufacturing Company, Limited, and Director of the Enfield Cycle Company, Limited; Lord Ernest J. Seymour, Chairman of the Enfield Cycle Company, Limited, and Director of the Metropolitan Bank (of England and Wales), Limited; Mr. George H. Cartland, Director of the Enfield Cycle Company, Limited, Chairman of Directors of the Eadie Manufacturing Company, Limited; Mr. Thomas Evans, Chairman of Ecco Works, Limited, Director of the Enfield Cycle Company, Limited; Mr. Robert W. Smith, M.I.M.E., Director of the Eadie Manufacturing Company, Limited, and the Enfield Cycle Company, Limited, and Director of Ecco Works, Limited; and Mr. E. H. Lancaster (Managing Director), who has been so successful in building up the Clement Car business in Great Britain.

Manchester District Motor Omnibus Company, Ltd.—Formed with a capital of £300,000, the prospectus of this Company was issued this week, 200 shares of £1 each being offered for subscription. One feature of the company is that there are no deferred shares. The company has been formed to carry on the business of a motor omnibus company in the Manchester district, for passengers, parcels and goods. A population amounting to about 1½ millions will be served. The service will cover the districts to the west and south of Manchester, which are of a residential and industrial character, and at present without adequate means of direct intercommunication, and will connect the tramway undertakings of Manchester, Salford, Stockport, Chester, and Warrington. The number of passengers carried during the past year on the several routes of these tramway systems to which the proposed motor omnibus services will act as feeders was 43,000,000. In order to ensure early delivery of at least forty motor omnibuses,

Three Orion Omnibuses which have run 50,701 miles between August of last year and February, 1906, one having been in work 27 weeks, the next 25 weeks, and the last 13 weeks, making an average of 109 miles per day after allowing for stoppages for overhauling. These omnibuses have been run by the Victoria Omnibus Company.

contracts dated 28th February, 1906, have been made by the British Transport Syndicate (Limited), with the Wolseley Tool and Motor Company (Limited), and John I. Thornycroft and Company (Limited), for delivery of forty motor omnibuses, commencing as soon as the company is ready to accept delivery.

NEW COMPANIES REGISTERED.

British Bariquand and Marre Engine Company (Limited), 18, Leadenhall Street, E.C.—Capital, £30,000 in £1 shares (20,000 preference). Object, to acquire the sole agency for Great Britain, India, Australasia, New Zealand, South Africa from the Cape to the River Zambesi and elsewhere, of motors for automobiles and parts, &c., of the make of "Bariquand and Marre." First directors, E. L. I. Blyth, H. C. Walrond, O. F. Massingberd-Mundy, and E. Haufeurt.

Manchester District Motor Omnibus Company (Limited).—Capital, £300,000 in £1 shares. First directors, D. Boyle, J. F. Albright, R. O. Ritchie, R. G. Wrightson, and H. A. Earle.

E. Mendelssohn and Company (1906) (Limited), 1A, Lancaster Gate, London.—Capital, £150,000 in £1 shares (100,000 six per cent. cumulative preference). Object, to acquire the business carried on by E. Mendelssohn and Company, Limited, manufacturers and repairers of automobiles, motor cars, &c. First directors, W. J. Masser, Vicomte Jules de Villelume Sombreuil, L. Pierron, E. G. P. Mendelssohn Bartholdy, Count Charles de Villelume Sombreuil, and A. Ménagé.

Milano Motors (Limited), 92, Gloucester Road, S.W.—Capital, £5,000 in £1 shares. Object, to adopt an agreement with Societa Milanese di Industrie Meccaniche for acquiring the sole agency in Great Britain for the Orel light car. First directors, C. Manuel, J. A. Wild, and F. H. Baker.

Motor Jobmasters (Limited), 79 and 80, York Street, Westminster.—Capital, £100 in £1 shares.

Newmobile (Limited), 78, Hamilton House, Bishopsgate Street Without, E.C.—Capital, £1,000 in 1*s.* shares. Object, to acquire from O. Percy the business of a motor car and accessory manufacturer and dealer acquired by him from P. G. Tachi, and carried on at 29, Nemoure-Road, Acton. P. G. Tachi is first director.

Premier Motor Company (Limited), 34, Waterloo Street, Birmingham.—Capital, £5,000 in £1 shares.

Silsden Motor Omnibus Company (Limited).—Capital, £2,500 in £1 shares. First directors, J. Townend, D. McDonnell, and J. W. Shuttleworth.

The Arrol-Johnston Agency (Limited), 166, St. Vincent Street, Glasgow.—Capital, £10,000 in £1 shares. Object, to carry on the business of proprietors, &c., of motor vehicles. Scotch company.

Morgan and Co., Ltd.

At the 21st ordinary meeting of the shareholders of this Company, held last week, under the presidency of Mr. J. W. Salisbury, the Chairman of the Company, a satisfactory Balance Sheet and Report were presented, and, when dealing with the automobile side of the business, the Chairman pointed out that the Directors' policy was one of caution and prudence in handling what was a comparatively new industry, as it was impossible to know what developments would take place, and what they would have to keep pace with in the motor trade. They were, however, contemplating expending a considerable sum in building a motor factory at Leighton Buzzard, as they found it was impossible for them to execute their orders without it. They would have, of course, also to put up some machinery, all of which was absolutely necessary if they were to keep pace with the times. The shareholders agreed with, and applauded the policy of the Directors in this respect. Mr. William Urquhart, the Vice-Chairman, said that a gratifying feature of the year had been the Company's success in the motor trade it was doing, and they had also the encouraging fact that that trade was greatly increasing during the present year.

London General Omnibus Company.

Very interesting were the facts given by Sir John Pound, Bart., the Chairman of the L.G.O.C., at the Company's annual general meeting held last week, in respect to the progress of the motor side of their business. He announced that during the latter portion of the half year the Directors had definitely decided to stop buying horses and to permanently close the training depôts, the result being an immediate large reduction in their stock of horses. At the end of December last, the Company had 29 motors at work. They now had 50 running, and by the end of the year they hoped to have 300 motors employed in regular service. Within three years they anticipated completing the substitution of motors for horses on the main roads. The capital expenditure necessary for this work they estimated at about one million sterling, and for the purpose of meeting this extra outlay of capital they proposed the creation of half that sum—£500,000—in 5 per cent. preference shares, the balance of the half million being provided, they hoped, by the non-replacement of their horse and rolling stock. The chairman repudiated very strongly the announcements that the British Motor 'Bus Trust or any other company or trust had control of the market for motor omnibuses. The Company were having brought to them almost every week offers from motor manufacturers, some of whom had proved the success of their machines, and at the present time they had under offer 200 from a firm whose motors were undoubtedly successful. The Company educated their own drivers, and as far as possible they intended employing them. The cost of motors, including bodies, ranged from £700 to £900. It was impossible, the chairman said, to say what the life of a motor omnibus was at present. That had yet to be learned. Of one thing he was quite certain, that motors would be able to hold their own against electric tramways.

COMMERCIAL POINTS.

Pneumatic Tyres for Motor 'Buses.

A new pneumatic tyre for motor omnibuses is, we learn, being brought out by the Continental Tyre Company after a long series of experiments have been made with it. It is much larger than the pneumatic tyres that are ever fitted to the ordinary pleasure vehicles, being 150 mm. and 165 mm. in size. The question of tyres for motor omnibuses is of so much importance that it is much to be hoped the new "Continental" tyre will fully come up to the hopes of this enterprising firm of manufacturers.

The Motor Boat Industry.

It is encouraging to find that Messrs. Brooke have recently received three important orders as the result of the enterprise with which they have developed the motor boat side of their automobile business. One of these is for a yacht's tender for the well known steam yacht "Midnight Sun." It is being built of mahogany, and will be 30 ft. long with a 6 ft. 6 in. beam. One of the 45-h.p. Brooke marine sets is to be installed, and the boat has a guaranteed speed of 14 knots. It is intended to use the launch not only as a passenger boat itself, but for towing three other boats, each loaded with thirty passengers.

Another order is for a 45-ft. passenger launch, for use on the Cam, which is being built under Board of Trade survey; while an 18-ft. teak boat is just being sent out for delivery to the Governor of Singapore.

Convincing Tests.

Those of our readers who purchase an induction coil from United Motor Industries or purchase any other coil elsewhere, can have the coil tested before their eyes with a proper apparatus at the U.M.I. depôt in London, 45, Poland Street, so that they can see the trembler speed, the current consumption, and also the result obtained from the coil when the spark has to jump across air under compression. The company inform us they will be very pleased to assist anybody to have these tests conducted with any coils in which they are interested, and the test can be carried out while the owner of the car is watching.

Motor Omnibuses and the Tyres they Use.

The Sirdar Rubber Company informs us that the London and South-Western Railway Company's new motor omnibuses are fitted with Royal Sirdar Buffer tyres, and also the new motor omnibuses of the Great Eastern Railway Company. The managing director also writes us that there has been a misapprehension with regard to the motor omnibuses of the Star Omnibus Company. It has recently been stated in the Press that they have been fitted with three makes of tyres; this is not so. All the new motor omnibuses of the Star Omnibus Company are fitted with Royal Sirdar Buffer tyres, with the exception of two sets which have been supplied by Messrs. Connolly and Co.

Mr. A. Mosses, who has been appointed manager of the Clement Motor Company, Limited, of 3, Leicester Street, Leicester Square, has been associated with the company since its inception in England. His experience in connection with motor cars and accessories is of a wide and practical nature. His engineering apprenticeship was served in the Midlands, and for three years Mr. Mosses was liner off for Messrs. Maudslay, Sons and Field, in naval engineering work. After eighteen months at Napier's works, he became head tester for the Dunlop Company, and for eighteen months was assistant manager for the Dunlop Tyre Department. Accompanying Col. Mark Mayhew, he took part in the Paris-Madrid Motor Race, and also drove in the 4,000 miles trial.

MR. J. F. CRUNDALL, the well-known racing cyclist, has joined the selling staff of the Vacuum Oil Company, Limited, manufacturers of the high grade motor car lubricants, known as Vacuum Mobiloils.

IN our last issue we gave a couple of interesting photographs of "Rapid" motor watering carts. The sole concessionaires for Great Britain, Ireland, and the Colonies, we learn, for the manufacturers of this Italian make of vehicle, are Messrs. Straker and McConnell, Ltd., of Avonmore Road, Kensington.

THE Clement Motor Company, Limited, have just received orders from Colonel W. J. Bosworth, chairman of the Automobile Association, for an 18–28-h.p. Clement, and from His Honour Judge Emden for one of their 14–18-h.p. cars.

THE Palmer Tyre, Ltd., in order to meet the requirements of the trade in Scotland for cycle and motor tyres, have opened a depôt at 6, Royal Exchange Square, Glasgow, where all orders for Scotland will be executed. Mr. J. S. Leather, who has been appointed as manager, has been connected with the London depôt for the last six years.

Diet for Motorists.

So great is the fascination of motoring that many are tempted to stay on the road for longer periods at a time than is sometimes altogether wise. The best safeguard against fatigue under such circumstances is good, wholesome, and concentrated nourishment. There is no better form of concentrated nutriment than the various "Plasmon" preparations, and the Company, with their usual energy and initiative, are now selling at 1*s.* 6*d.* a very attractive sample box (in art metal) of various preparations into which "Plasmon" has been successfully introduced. These not only include the well-known biscuits and equally well-known chocolate and cocoa, but also a nicely bound cookery book of 64 pages, giving a vast amount of valuable information in the way of recipes, &c., for household use. The box should certainly have the effect of still further popularising "Plasmon," particularly, we hope, amongst motorists, to whose requirements it is so specially suited.

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BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

11135. 27th May, 1905. Improvements in Ignition Devices for Internal Combustion Engines. Frederick R. Simms, Welbeck Works, Kimberley Road, Willesden Lane, Kilburn, London. This invention relates to electric ignition devices for internal combustion engines, and to that class of such devices wherein the spark is obtained by the movement of a rod relatively with the ignition-plug. The plug is screwed into the cylinder, or into a chamber in communication therewith by an ignition port, and has extending through it into the chamber a rod insulated from it by means of the usual soapstone washers. There are two figures. Fig. 1 is a sectional elevation. *a* is a chamber in communication with the cylinder of the internal combustion engine by means of the port, *b*, *c* being a flange by means of which the chamber, *a*, is screwed to the cylinder. *d* is the plug of the ignition device, and *e* is the rod which extends through the plug, *d*, from which it is insulated by the soapstone washers, *f*. *g* is the lateral extension of the chamber, *a*, the inner end, which is within the chamber, *a*, having the conical head, *i*, which is normally held in contact with the head, e^1, of the rod, *e*, by means of the spring, *j*, which is coiled round the rod, *h*, within a hollow portion, *k*, of the extension, *g*, one end of the spring, *j*, bearing against the end of the extension, *k*, and the other against a collar, *l*, keyed upon the spindle, *h*. *m* is the seat in the chamber, *a*, for the conical-head, *i*, of the spindle, *h*, and *n* is the operating-lever. Normally the conical-head, *i*, bears against the head, e^1, of the rod, *e*, so that no sparking takes place. At the moment at which ignition is to take place, the lever, *n*, moves the spindle, *h*, away from the rod, *e*, thus enabling the passage of the spark to take place. The backward movement of the spindle, *h*, causes the conical-head, *i*, to close upon the seat, *m*, thus preventing the escape around the spindle, *h*, of gas from the chamber, *a*.—February 14th, 1906.

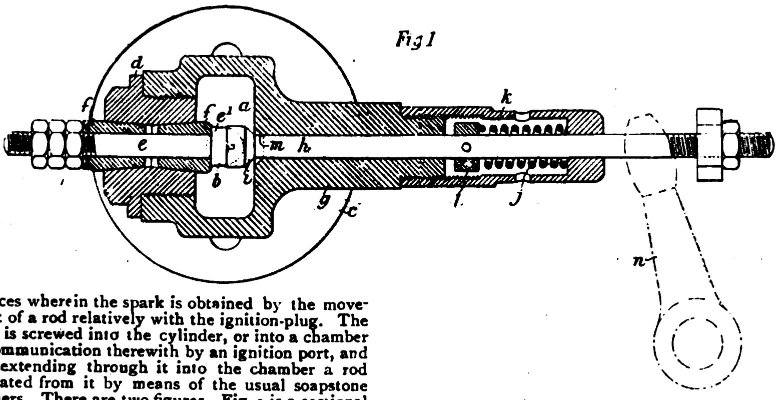
Fig 1

2492. 7th February, 1905. Improvements in Internal Combustion Engines. The British Thomson-Houston Co., Ltd., 83, Cannon Street, London, E.C. A communication from the General Electric Co. of Schenectady, U.S.A. This invention relates to an engine having some features in common with the explosion and compression type of engine and others in common with constant pressure engines. In operation the invention utilises the principle of a constant pressure engine in that it compresses, either in power cylinder or in a separate cylinder, a quantity of air and stores the same under pressure in a reservoir. There are thirteen figures. Fig. 1 is an elevation, partly in section, of an engine. W is a fly-wheel of the engine mounted upon a shaft, upon which a crank, K, is fixed. The crank, K, is moved by a connecting-rod jointed to a piston-rod, P^2, working in a cylinder and having a piston, P, P^1, attached. C is a water-jacket. The portion, C^1, which may be heat-insulated from C, is allowed to attain a fairly high temperature. The piston itself is in two sections, and the section, P, is comparatively cool, being in contact with the water-jacketed cylinder walls of C, and it has grooves in its exterior with packing rings. Section, P^1, is borne upon section, P, and is made of refractory metal, such as cast nickel or cast iron, and it may be heat-insulated from section, P, and filled with loose asbestos or some other packing. At the back of the cylinder and fastened to the back cylinder head is a chamber, H, which can be heated externally to a red heat. It communicates with the cylinder space by a neck. A jet, J, is mounted so as to inject at proper intervals a fine stream of hydrocarbon oil or vapour, the jet being so fine as to divide it up into a spray-like condition. The jet, J, is fed by an oil pipe, *q*, and the check valve, *t*, is mounted near the jet to prevent regurgitation. The pipe, *q*, leads from oil-pump, F^2, immersed in a fuel receptacle, F. The oil-pump, F^2, is operated by a piston-rod, O^2, set in motion by a lever, *l*, acting against a spring, Z^3, the lever, *l*, being a bent lever, and being prevented from moving too far by a stop, s^2. The lever, *l*, is actuated by an upright lever, M^2, through the agency of the compressed spring, Z^2, and at the upper end of the lever, M^2, is a roller which runs upon cam, K^2, upon the main shaft. The lever, M^2, has a double function, as it also sets in motion the long rod, r^1, to open valve, S^1, through the agency of lever, L, and it may be returned by suitable springs. The cam, K^2, acts upon another lever, M, which reciprocates rod, r^2, which, acting on lever, L^2, operates the exhaust-valve, E, of the engine at suitable intervals. At A and A^2, are right and left threaded connectors whereby the adjustment of the effective lengths of rods, r^1, r^2, may be easily accomplished. At I, in cylinder, C, is an inlet-valve closed by a light spring. Z is the outlet valve, also closed by a light spring for compressed air, and a passage is provided communicating from the cylinder space to the reservoir, T, which is an air-tight enclosure capable of holding air at considerable pressure, several atmospheres at least. Air can be admitted from T through a valve, V, opened by a bell-crank lever, U, and nut, S^2, upon a packed screw, H^2, serving as a controlling handle. A check-valve, S, is inserted in the passage from valve, V, up to the cylinder for the purpose of checking any vapours from moving backward towards the tank, T. A small regenerator, R, is introduced, consisting of material with fine interstices for the passage of hot gases from the cylinder and for the storage of the heat therefrom, which heat is again taken up on the admission of the incoming air from the tank to the cylinder, C. An oil-cup, o^3, is mounted so as to enable a little lubricating oil to be admitted to the engine with the indrawn air through valve, I. The piston, in moving forward, compresses the air in front of it forcing it through valve, Z.—February 14th, 1906.

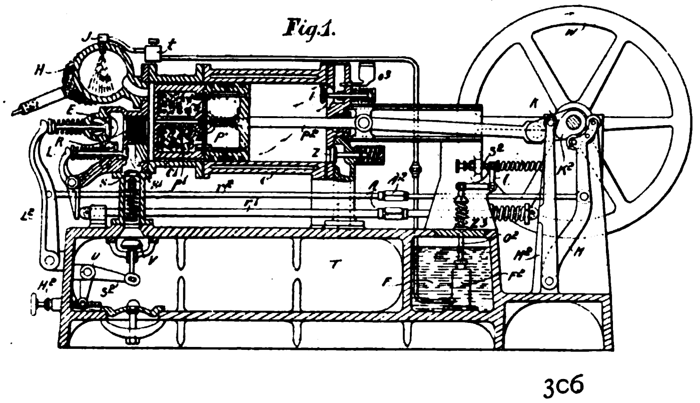
Fig. 1.

Patent Specifications Published.

Applied for in 1905.

Published March 1st, 1906.

17,363.	C. G. BAUER AND BAUER CO. Rotary engines (gasoline, steam).
17,384.	E. DOMBRET. Transmission mechanism.
20,880.	A. LOUIS. Carburettors.
21,631.	O. PATIN. Elastic tyres.
24,744.	P. ALBERTINI. Valve reversing mechanism.
24,843.	L. RENAULT. Shock-absorbing devices.
25,168.	KRIEGER AND CIE. Securing gear-wheels on shafts.

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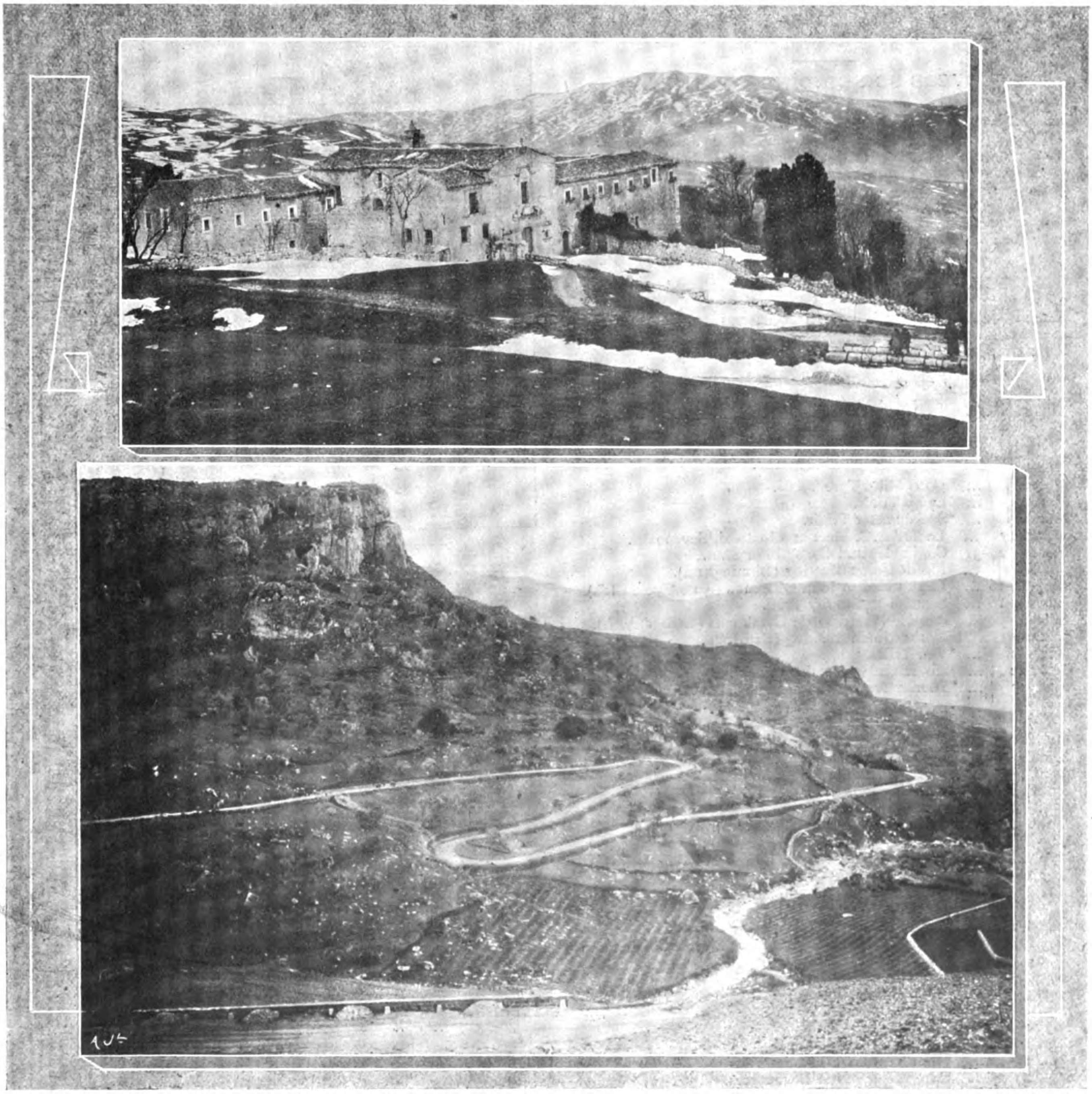

THE TARGA FLORIO IN SICILY.—The scenery through which this important Tourist Car Race will take place on May 6th, is of a very varied character, embracing the most delightful sylvan views, and some very wild and mountainous country. Our views above, and elsewhere in "The Automotor Journal" this week, convey some idea of the test in store for those who take part, the acutely winding roads being a special feature of the selected course. The upper photo shows the Convent of Petralia Sofrana, and the lower one the twisting road in the Valley of Caltavuturo.

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DIARY OF FORTHCOMING EVENTS.

British Events.

March ...	*4,000 Miles Tyre Trials.
March ...	*Lamp Trials.
March ...	*Speedometer Trials.
March 17 ...	Ladies' A.C. Meet at Montreal, Sevenoaks.
March 24-31	Cordingley and Co.'s Motor Show.
May 26 ...	Motor Union Meeting (Birmingham).
June 11-16 ...	Land's End to John O'Groat's (Auto Cycle Club).
June 13-16 ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July 21 ...	Motor Union Meeting (Bath).
Aug. ...	*Van Trials.
Sept. 22 ...	Motor Union Meeting (York).
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

March 25-31	Nice week.
April 1-15 ...	Monaco Motor Boat Exhibition and Races.
April 1-17 ...	Budapest Exhibition (A.C. of Hungary).
April 18-26 ...	French Resilient Wheel Trials.
April-May ...	Milan Exhibition.
May 1-15 ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 12-24 ...	Tour de France (Motor Cycles and Voiturettes).
May 14-31 ...	Milan Reliability Trial.
May 27 ...	Motor Bicycle Championship (Moto Club de France).
June 6-13 ...	Herkomer Cup.
June 17 ...	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 28-29 ...	Kiel Motor Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14-17 ...	Ostende Meeting.
July 26-Aug. 15	Circuit Européen.
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15-16 ...	Mont Ventoux Hill-Climb.
Sept. 20 ...	Lake Major Motor Boat Races.
Oct. 5-14 ...	Leipzig Exhibition.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

Motor 'Buses Going too Fast.

The London Road Car Company have been the victims—we mean the defendants—in an action by the police for exceeding the limit of 12 miles an hour for motor 'buses, in which some of the strangest evidence ever relied upon in a court of law was tendered. The police said that some of the Company's motor 'buses went at more than 12 miles an hour, which they are not permitted by the regulations of the Local Government Board to do. The defence of the Company was that it was impossible for the 'buses to exceed that limit, as they were provided with a special governor which immediately cut down the speed of the engine when it had been reached. The magistrate, Mr. Plowden, was much impressed by this, but the summonses were adjourned to enable the police to ascertain whether the governors were reliable as stated or not. As the result of their investigations they maintained that the governors could be tampered with, whereas the chronographs were absolutely reliable, and they produced, in support of the latter contention, the actual manufacturer of these instruments, a Mr. Meader, who is a watchmaker of Albany Street, Regent's Park, who said that, speaking from twenty years' experience, the chronographs *supplied by him* to the police and other Government officers were *infallible* instruments. Mr. Plowden, who apparently accepted the alleged infallibility of Mr. Meader's chronographs as maintained by himself, and as the result of the police investigations doubted the infallibility of the governors on the motor 'buses, particularly as the defendants had not attempted to bring evidence in the governors' support. He accordingly convicted the defendant Company. We cannot help wondering whether it is customary in police courts to accept the evidence of a manufacturer in favour of his own contrivances as fair and unprejudiced. Would any reasonable person have expected Mr. Meader to say that his chronographs were *not* reliable, and that in placing reliance upon them the police were likely to commit a serious error? Had he said so, he might as well, for all practical purposes, have put up the shutters at Albany Street and declared so much in the £. Surely it was a complete travesty of justice to accept evidence of this kind. Only that of an independent expert should be considered for a moment, while after all, even with the best chronograph, it is more a question how it is used than of the perfection of the particular instrument employed.

◆ ◆ ◆

The Wrong Way to Tackle the Subject.

In spite of the idiosyncracies of the evidence, however, we believe that this prosecution was an attempt on the part of the police, and perhaps a well-intentioned one, to curtail the evil to which we have on previous occasions referred. We mean the racing on London streets between the motor 'buses of rival companies, and the nursing of the new vehicles by motor 'buses put on the streets by old companies, apparently expressly for that purpose. Whether they secure convictions or not, we think the police in endeavouring to stop such malpractices, are adopting the wrong method in making it merely a question of speed. They are obviously cases which come under the first section of the Act, about "driving to the danger of the public," and the practice is objectionable, not so much on account of the precise speed attained, as owing to the way in which the whole campaign is conducted, it is calculated from start to finish to bring the public, whether as passengers on the 'buses, users of other vehicles, or ordinary pedestrians walking about the streets, into serious danger. The speed of 12 miles an hour to which motor 'buses are restricted is, after all, an arbitrary limitation, particularly in view of the fact that steps have been taken to permit a maximum speed of 16 miles an hour to the County Council's trams. There is accordingly something invidious in basing a prosecution on this point only, whereas if the appeal were made by the police to the first section of the Act—a section which is designed to protect the public against exactly this sort of thing—the public would at once see that these prosecutions were designed to prevent a growing evil, and were not merely part of the general police campaign against self-propelled traffic, which has excited so much derision and contempt.

◆ ◆ ◆

A Result of Municipal Trading.

We referred recently to the fight between the Birkenhead Corporation and the Mersey Railway Company, in regard to the motor 'bus service which the railway company had organised to bring the passengers to its station. This was done, it will be remembered, because, it was stated, the Corporation endeavoured to starve the railway company by so arranging its tramway and ferry service across the Mersey as not to suit the trains. The matter was brought into the Court of Chancery, before Mr. Justice Warrington, and the learned judge decided that it was a case which came under the decision of the House of Lords, in regard to the London County Council 'buses which used to run from the tramway termini across Westminster and Waterloo Bridges. He accordingly granted an injunction to the Birkenhead Corporation, restraining the railway company from running their motor 'buses. Needless to say the railway company is appealing, so that the matter is not yet finally decided.

◆ ◆ ◆

Of General Importance.

The subject is one of more universal applicability and importance than it may at first sight appear to be. It is not merely a question of a fight between one particular corporation and one particular railway company, but it involves quite a number of similar cases where railway companies are running motor 'buses in districts in which corporations happen to possess Parliamentary powers of catering for public traffic. In fact, if universally applied it might affect quite a large number of those railway extensions, by means of motor 'bus, which are giving the greatest satisfaction to the public in many places. We are sure, therefore, that there will be no lack of funds to support the railway company's appeal, and that if the judgment is adverse to them in the Court of Appeal, the case will ultimately be taken to the House of Lords. Whether the case is on all fours with the London County Council case, which was decided in a particular way, mainly owing to the influence of the late Lord Chancellor, or not, is one which their lordships ought certainly to have an opportunity of pronouncing upon *de novo*.

Against Unlimited Appeal.

"Arising out of this," we are glad to embrace the opportunity of protesting once more against the unlimited right of appeal which prevails in this country. It benefits the lawyers, no doubt, but it is hard to see that it benefits anybody else. The sensible arrangement prevails in Germany that appeal to a higher tribunal is only permissible where the Court of First Instance and the Court of First Appeal differ in their opinions. We have previously advocated a similar system in this country. That would mean that appeal to the House of Lords, the most expensive form of litigation existing, would only be permissible where the Court of First Instance and the Court of Appeal differed in their views. Such an arrangement would be a distinct benefit to the public, however unsatisfactory it might be to the legal profession, and some day we hope to see a general Press campaign in favour of this most necessary and salutary reform in our legal procedure.

◆ ◆ ◆

The Metric System in Great Britain.

Whenever an opportunity has offered, we have always advocated, with all our might, the importance of bringing Great Britain into harmony with the Continental nations, by the adoption of the metric system of weights, measures, and coinage, and have also insisted on the unquestionable advantage to the commercial and technical men of the country that would result from its general and compulsory adoption. There is no more progressive Member of the House of Commons than Mr. Henry Norman. He has for long been a powerful influence in the great Liberal party, and, as everybody knows, is, at the same time, one of our most ardent motorists. In his periodical, *The World's Work*, he has done yeoman service for the automobile movement, and he has just contributed to *Scribner's Magazine* an absorbing and enthusiastic automobile article, entitled "The Flowing Road."

Mr. Norman is nothing if not progressive, and he naturally wishes to see the metric system, which has for some time been legal, made compulsory. Accordingly, therefore, he sought an interview with the Prime Minister on the subject, and asked Sir Henry Campbell-Bannerman whether he would give time to pass a Bill to make the metric system compulsory, or, failing that, appoint a small Committee to enquire whether the change could not be effected with comparatively little opposition. He received a perfect *non possumus* reply, and, as he observes, this uncompromising general negative to the proposal forms the most "sweeping refusal such a proposal has received for many years, and it is the more disappointing as coming from the most progressive of recent Prime Ministers." It is scarcely worth while to reproduce the arguments in favour of rendering the metric system compulsory. The topic has been the subject of such exhaustive discussion in the Press, our present ludicrous medley of weights and measures has been for so long a complete laughing-stock of our Continental neighbours, such a source of trouble and confusion to everyone who has to make calculations, to engineers, chemists, accountants, book-keepers, merchants, manufacturers, and business men generally, that the whole thing is really past discussion. The country in fact, and Parliament, are in the position of a man who is firmly convinced that he is in need of a bath, but cannot prevail upon himself to take the necessary plunge, and in such a case, it is not argument that is needed—but a good forcible push.

◆ ◆ ◆

A Gloomy Lookout for the Ratepayers.

For a long time past we have warned the London County Council and other municipal authorities that, by undertaking their colossal expenditure on electric trams—which has been the subject of so much discussion in the Press generally—and neglecting the possibilities of the motor 'bus, they were putting the ratepayers' money on the wrong horse. There is not only the enormous capital expenditure—so huge, in fact, that it is likely to cripple even the wealthiest city in the world—but there is the much more serious question of what will happen if the tramways fail to pay owing to the competition of the motor omnibus. That this is no mere fantasy of interested automobilists is pretty clearly shown from what is going on abroad. Owing to this cause Berlin has decided to spend no more money on electric tramways. Munich is considering the adoption of municipal service of motor omnibuses, and the same means of locomotion are being adopted even in such out-of-the-way places as the Tyrol. It must be remembered that not till two more years have elapsed will the London County Council's system of electric trams be completed. Those who have seen what the development of the motor 'bus has been during the last year will hesitate even to guess to what extent its capabilities may develop in the next two years, and when the finishing touch is put to the great tramway system it is not at all impossible that it will be found to be hopelessly out of date and outclassed by the motor 'bus.

* * * *

Motor Car Legislation.

IN the House of Lords on Tuesday, Lord Montagu of Beaulieu asked the question whether, if the Royal Commission on Motor Cars reported before Easter, the Government could promise a Bill on the subject during the session. In order to avoid hasty legislation, he suggested that the existing Act, in spite of its imperfections, should be extended for another year, *i.e.*, brought under the Expiring Statutes Continuance Act. Earl Russell expressed the hope that the present Act would not be included in the Expiring Statutes Continuance Act indefinitely. In reply, Earl Carrington stated that it was at present impossible to say when the Royal Commission would make its report, and therefore impossible for the Government to make any announcement. There would, he continued, be neither delay nor undue haste, and if the Committee were unable to report in time for a new Bill to be brought in this year, the course proposed by Lord Montagu would be adopted. This, it will be remembered, is the course which we last week indicated as the one likely to be taken.

Another Service of Municipal Motor 'Buses.

THE Tramways Committee of the Nottingham Corporation, which supervised an extended system of electric trams, have taken a notable step of introducing motor 'buses, to give travelling facilities to the dense population in what is known as the Carlton Road district, and are accordingly commencing a service of motor 'buses from the great Market Place to the Carlton Road. The 'buses, which are being supplied by Messrs. Thornycroft and Co., have been on order some time. They are to be delivered this week, so the service will soon be in working order.

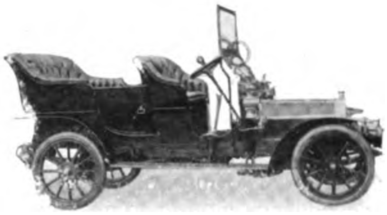
How to Recognise the Cars of To-day.

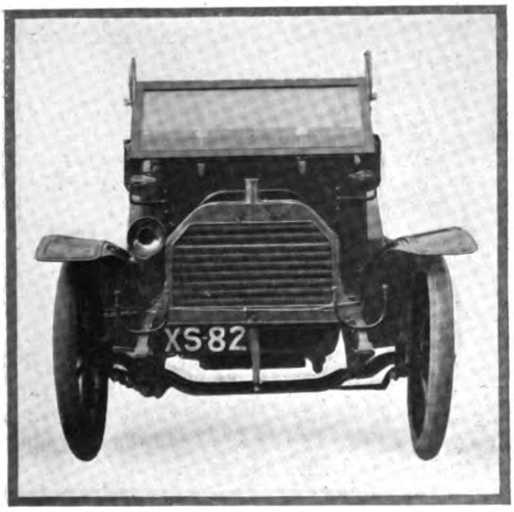
(No. 11).

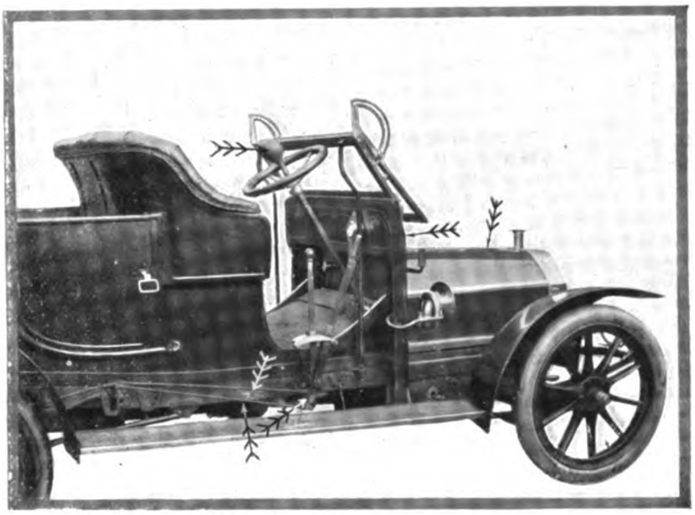
The New Arrol-Johnston

(BRITISH)

12-15 & 24-30 H.P.







On the smaller model the BONNET is BROADER THAN IT IS HIGH. In other respects the characteristics of both are alike. The BULB FOR THE HORN projects from the centre of the steering wheel, and the COMPENSATING GEAR FOR THE SIDE BRAKES is fitted to the lower end of the hand lever. Owing to the relatively greater height of the frame from the ground, these cars have the appearance of being very low-built.

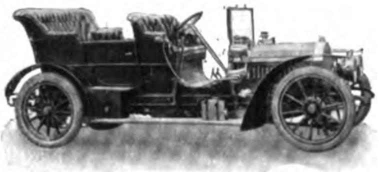
* * *

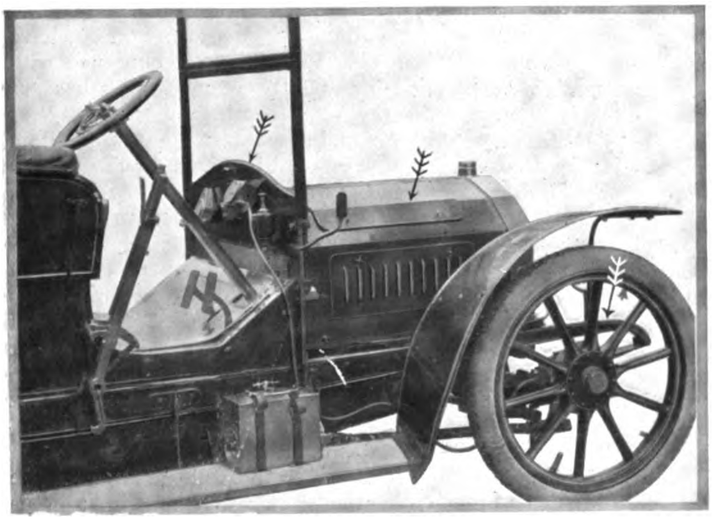
(No. 12).

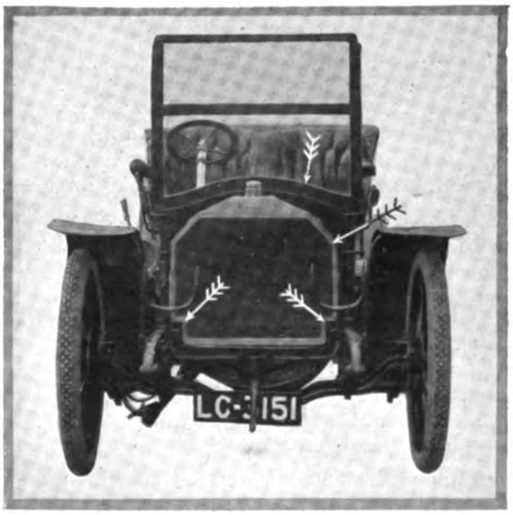
The Crossley

(BRITISH ENGINE)

22 H.P. & 40 H.P.







At the bottom corners, the RADIATOR IS UNDERCUT to rest upon the frame, and, except at the top, the TUBES EXTEND CLOSE UP TO THE EDGE. Although not multi-jointed, the SHAPE OF THE BONNET suggests that form of construction. The LEVERS and PEDALS resemble those of a "MERCEDES" car, but the CURVED-TOPPED DASH is comparatively free of multiple-feed lubricator fittings. Both in front and behind, the SPRING-HORNS project considerably.

FAIR PLAY?

THE WOLSELEY COMPANY AND "THE AUTOMOTOR JOURNAL."

THE AUTOMOTOR JOURNAL has always stood for fair play, independence and impartiality, even in the dark and doubtful days when the modern automobile movement was inaugurated, and this attitude has been maintained even in times when the prosperity of the movement was the plaything of financiers of doubtful intentions and company promoters who proved its worst enemies. The motto of *sans peur et sans reproche* which has topped the flood for nearly a decade of changeful and adventurous years, we are not going to lower now, when the movement has entered on a period of decided prosperity. Above all, we have a strong objection—the English objection—to anything presenting even a suspicion of coercion, particularly if it is in any way directed against what we have always regarded as our duty, of seeing fair play between our supporters, readers, and contributors.

There are necessarily drawbacks, commercially, to conducting a journal in a thoroughly impartial and straightforward spirit, and these we are at all times prepared to accept with a good grace. When, however, they take the form of attacks directed against the independence of the journal, we think it is time to make public protest. A case of this character has just occurred, and so pronounced is it that we feel compelled to draw general attention to it in the interests of the automobile industry and of motorists generally, especially as it concerns one of the best-known firms of manufacturers, who have always earned world-wide respect by their consistent fair dealing with everyone—we refer to the Wolseley Tool and Motor Car Company.

Many of our readers will notice the absence of the Wolseley Company's usual advertisement from this number of THE AUTOMOTOR JOURNAL, and we feel convinced that nearly every reader will feel indignant when they learn that the withdrawal of the advertisement arose out of a controversy in our columns between that Company and Mr. S. F. Edge (which was of the Wolseley Company's own seeking), and that the following are the facts of the case:—

Two weeks ago, through their General Manager, Mr. Siddeley, very strong exception was taken to a public statement made by Mr. S. F. Edge concerning the improved outlook of British manufacturers in competition with imported cars, in the form of a strongly-worded letter on the subject, sent for publication to the motor Press. That letter was published in these columns, but not before we had taken the trouble to put ourselves in communication with one of the Company's representatives (in Mr. Siddeley's absence abroad), and had been assured that the matter had been well considered in all its bearings, and that Mr. Siddeley was quite prepared to meet any adverse replies.

Not unnaturally, the reply from Mr. Edge was of an extremely trenchant character, but much as we disliked the whole spirit of the controversy, we had no alternative—after having printed the original letter—and consequently Mr. Edge's letter was published in this Journal last week.

Next comes the sequel—a letter from the Wolseley Company to the publishers of THE AUTOMOTOR JOURNAL—which we now give in full as follows:—

9th March, 1906.

Messrs. F. King and Co., Ltd.,
44, St. Martin's Lane, W.C.

DEAR SIRS,—With reference to the advertisement at present appearing in THE AUTOMOTOR JOURNAL, kindly take this letter as a cancellation of any order standing at the present time in regard to same, as we do not wish our advertisement to again appear therein.

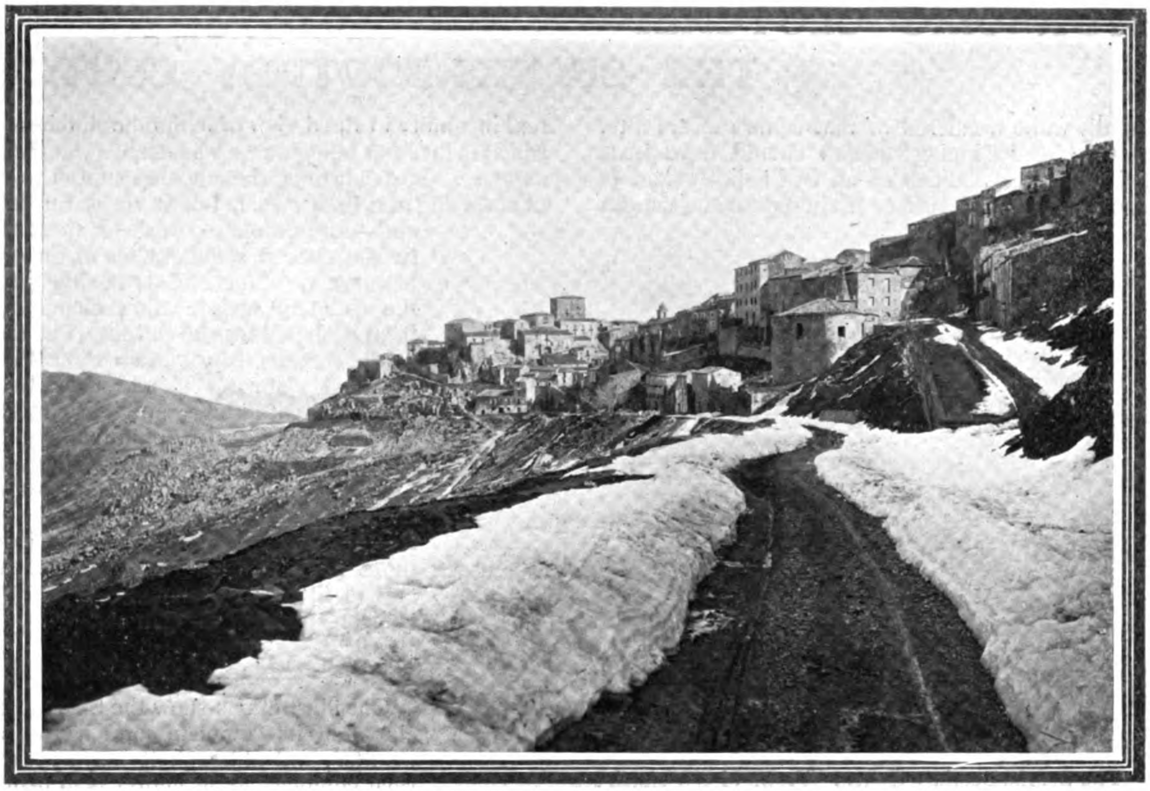
Yours faithfully,
For THE WOLSELEY TOOL AND MOTOR COMPANY, LTD.
(*Signed*) J. D. SIDDELEY,
General Manager.

It only remains to say that subsequently, when communicating with the general manager personally on the telephone, we were unhesitatingly informed that the action taken by his company was wholly and solely due to our having published Mr. Edge's reply.

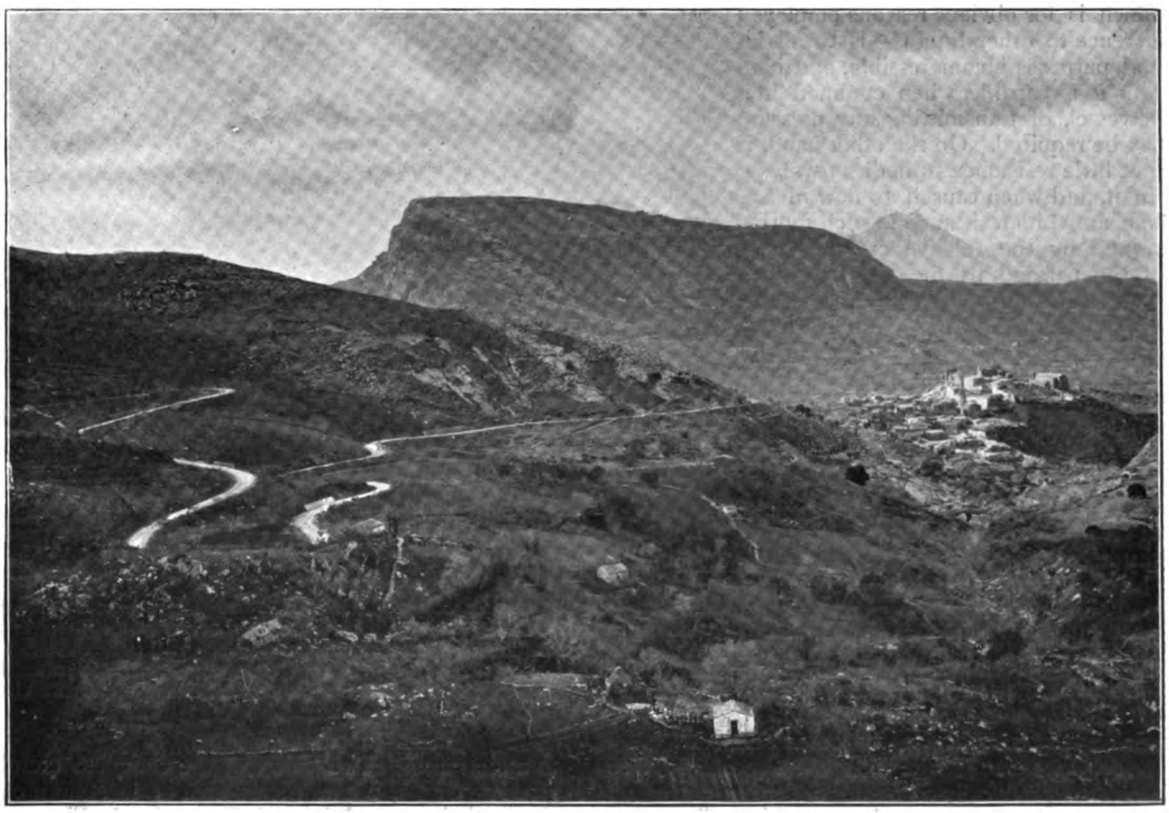
Beyond old association with those responsible for building up that important concern, the mere fact that the Wolseley Company's support has been withdrawn from us is of little moment, as compared with the all-important reason which has brought it about. We hardly think our worst enemies would suggest that THE AUTOMOTOR JOURNAL has ever been conducted, during the ten years of its existence, other than in an absolutely impartial and, we hope, judicious manner. We have always protested against personalities or veiled attacks in the correspondence columns, which must inevitably lead to retaliation and more personalities, and, as far as possible, have always kept such communications out of our columns. Circumstances, however, arise at times when, in justice to those concerned, letters containing sweeping statements, amounting almost to direct accusations, have to be admitted to our columns, and in accordance with British ideas of fair play, a hearing necessarily has *per contra* to be given to the other side if they so elect.

It is somewhat alarming, in the interests of the freedom of the Press, if grounds should be given for the idea to prevail that no journal can be run on impartial lines, but that it is liable to lose the support of any advertising firms—even though it is obviously to their loss also—if in the correspondence columns they happen to get an "answer back." However much the proprietors of this Journal may regret losing the moral and commercial support of the Wolseley Company, our readers may rest assured that they have no intention of attempting to coerce the Editorial department, in the conduct of THE AUTOMOTOR JOURNAL, into sacrificing the supreme interests of its readers and the industry.

It is with a view to as far as possible preventing the recurrence of such incidents, and so doing what in us lies to preserve the proper and dignified independence of the automobile Press, that we have made this incident public.



THE TARGA FLORIO RACE IN SICILY.—On the course selected for the cars. The entrance to Geraci-Siculo.



THE TARGA FLORIO RACE IN SICILY.—In our Frontispiece we show a very intricate winding road near Caltavuturo. Another serpentine portion of the course on the road near Collesano, is seen in the above photograph. This picture also gives a good idea of the rugged character of the country.

HYDRAULIC CLUTCHES— THE SPARKS-BOOTHBY CLUTCH.

It is hardly to be wondered at that some seekers after a good type of "slipping" clutch should have been attracted by the possibilities of an hydraulic system in preference to relying on surface friction pure and simple.

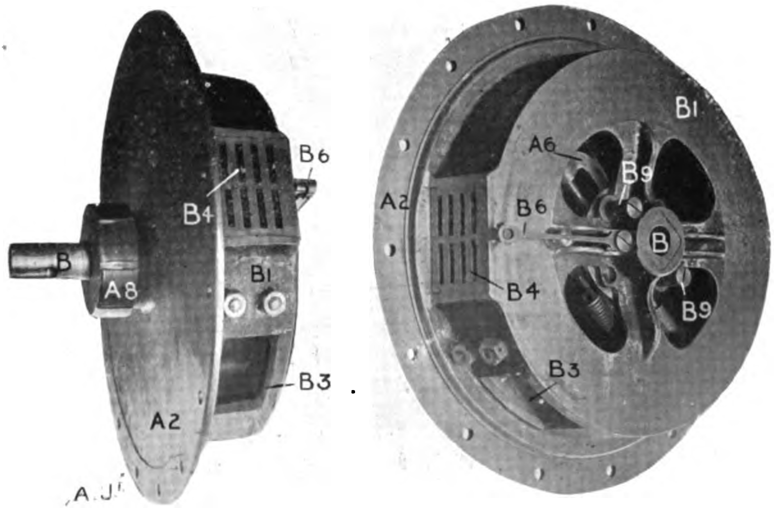


Fig. 1.—The Sparks-Boothby Clutch. Views of the clutch complete ready for fixing to the fly-wheel. Parts of both members of the clutch are visible in this view. Although apparently solid, the casting, B^1, is separate from the casting, A^2, which is bolted to the fly-wheel.

Oil—which is for obvious reasons employed in preference to other liquids—is to all intents and purposes incompressible, and consequently it is capable, when confined in a suitable vessel, of transmitting any pressure that may be required. On the other hand, it offers but little resistance to bodies revolving freely in it, and when caused to flow in any specific channel its resistance to such motion is governed by the relative cross-sectional area of the passage to the volume which is being forced through in a given time. Suitably constructed, therefore, an hydraulic clutch might well possess the three attributes most desired, *i.e.*, absolute freedom when not transmitting any power, gradually variable resistance (easily controlled slip), and positive dead-lock when fully engaged.

Principles of an Hydraulic System.

Such a mechanism would almost of necessity comprise some kind of pump that might be made to circulate the oil, combined with some form of throttle-valve, which could conveniently be caused to vary the effective area of the passage, and so introduce more or less resistance to the free flow of the oil. If the flow of oil were quite stopped, the entire apparatus virtually becomes one solid body, whereas if the flow were perfectly free there would be practically no tendency for the "driven" portion of the clutch to compel the "driving" portion to revolve with it. It is, of course, the adaptation of this simple principle to motor car use that demands real ingenuity in the design of hydraulic clutches—a task which is far from being as easy as some motorists might suppose. Not only must the whole apparatus be capable of revolving at a high speed, but it must be compact, and—for automobile work—it must conform to the special requirements of an ordinary motor car. Mechanisms having pumps of the ordinary reciprocating character, have been designed for the purpose, but there are many reasons why certain difficulties of a practical character should have been experienced with them, and it is more than probable that a rotary pump of one kind or another will always be found more suitable for this sort of work. Such at least is the opinion of those responsible for the Sparks-Boothby hydraulic clutch, which is one of those most to the fore at the present day, and is fitted to a standard type of petrol vehicle—the new Morgan car.

Action of the Clutch.

Our illustrations show the Sparks-Boothby clutch in its complete form as well as dismantled, and although it may appear somewhat complicated, its action is in reality very simple, and its adaptation of the principle previously explained is by no means difficult to understand. Two views of the complete clutch are given in Fig. 1, but a better idea of its action can be obtained from the left hand illustration in Fig. 2, which shows the clutch actually bolted to the engine fly-wheel, part of which has been cut away in order to expose the

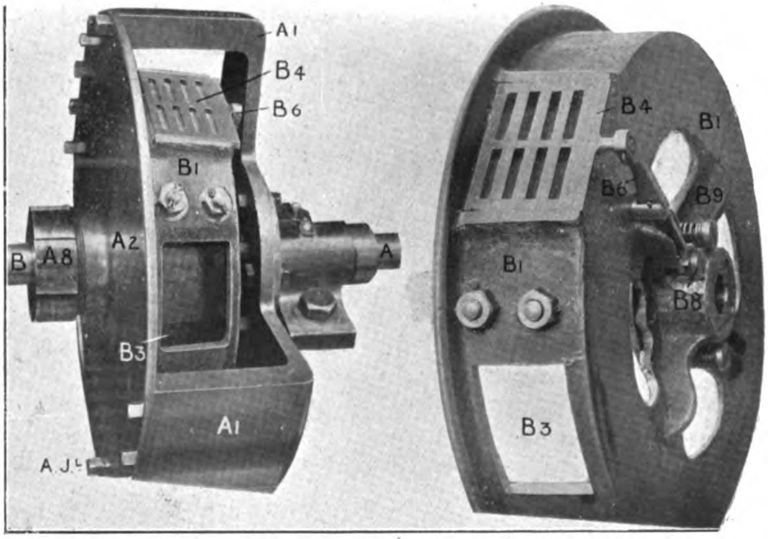


Fig. 2.—The Sparks-Boothby Clutch. On the left is a view of a model showing the clutch in place within the fly-wheel of an engine. It is the casting B^1, which forms the clutch-driven member, this is fixed to the shaft, B. On the right is a larger view of part of this inner member, B^1, showing the grid-valve, B^4, and its mechanism by which the clutch is operated.

interior. As usual, there must, of course, be two main members to the clutch, the engine-driven portion and the clutch-driven portion, and it is the various parts of these that are denoted by the letters A and B respectively.

In this clutch, the pump-chamber, C—which is most clearly illustrated in the sectional line drawing, Fig. 3—is of annular shape, but there is a small division piece, B^2, which prevents the annulus being complete. Small paddles, A^4, constitute the pump-vanes, and these are carried by part of the driving member. The entire fly-wheel is filled with oil, and directly the engine is started the pump-vanes, A^4, begin circulating the oil, which is forced out of the pump-chamber, C, through the opening, B^3, and thus into the outer passages, C^1, from which it passes back into the pump-chamber through the valve, B^4. So long as the valve, B^4, remains open, thus allowing free circulation to take place, the clutch remains disengaged, but if the valve, B^4, is partly closed, a back pressure is set up which resolves itself into a direct thrust through the intervening column of oil, between one of the paddles, A^4, and the stop, B^2. Under such circumstances the shaft, B, to which the stop, B^2, is indirectly attached, is consequently driven by the engine-shaft, A, which carries the paddles, A^4, but it is only when the valve, B^4, is quite closed that the speed of rotation of the two shafts is compelled to be the same, because under all other conditions the partial circulation of the oil allows relative slip to take place.

Two other views (Figs. 4 and 5), showing respectively the two main portions of the clutch separately, complete our series of illustrations, which render the details of the construction of the clutch almost self-evident. It will be noticed that the two principal members somewhat resemble those of the ordinary metal cone friction-clutch, and, as a matter of fact, a similar sliding to and fro action does take place in the clutch just when it is being engaged or finally disengaged. That is to say, the action of the throttle-valve is supplemented, during the final stage of freeing the clutch, by a positive separation of the two members, so that they can run quite freely in their oil bath.

Details of Construction.

Although the general arrangement of the parts of the clutch is very clearly shown by the photographs and drawings, some further description of the constructional details will, nevertheless, no doubt, be useful. In order to make the clutch occupy as little room as possible it is so constructed that it can be enclosed inside the fly-wheel, A^1, as shown in Figs. 2 and 3. Leaving the fly-wheel itself out of consideration for the moment, however, the main engine-driven member of the clutch is represented by the plate, A^2, which is cast solid with the conical ring, A^3. This plate is, it will be noticed, bolted direct to the fly-wheel when finally in place. Carried by the ring, A^3, are the two paddles, A^4, the exact arrangement of these parts being very clearly illustrated in Fig. 4. Each paddle is cast with an arm, A^6, and these arms spigot into one another in such a way that the two paddles are well guided and supported, when in place. In order to produce the reciprocating motion necessary to enable the paddles to clear the stop, B^2, when the clutch is slipping, the arms, A^6, which are provided with small rollers for the purpose, are drawn down against a cam, B^5, by means of springs, A^7. The cam itself, is, of course, part of the clutch-shaft, B, being keyed direct to it in such a position relatively to the stop, B^2, that the reciprocating motion of the paddles synchronises properly.

(*To be concluded.*)

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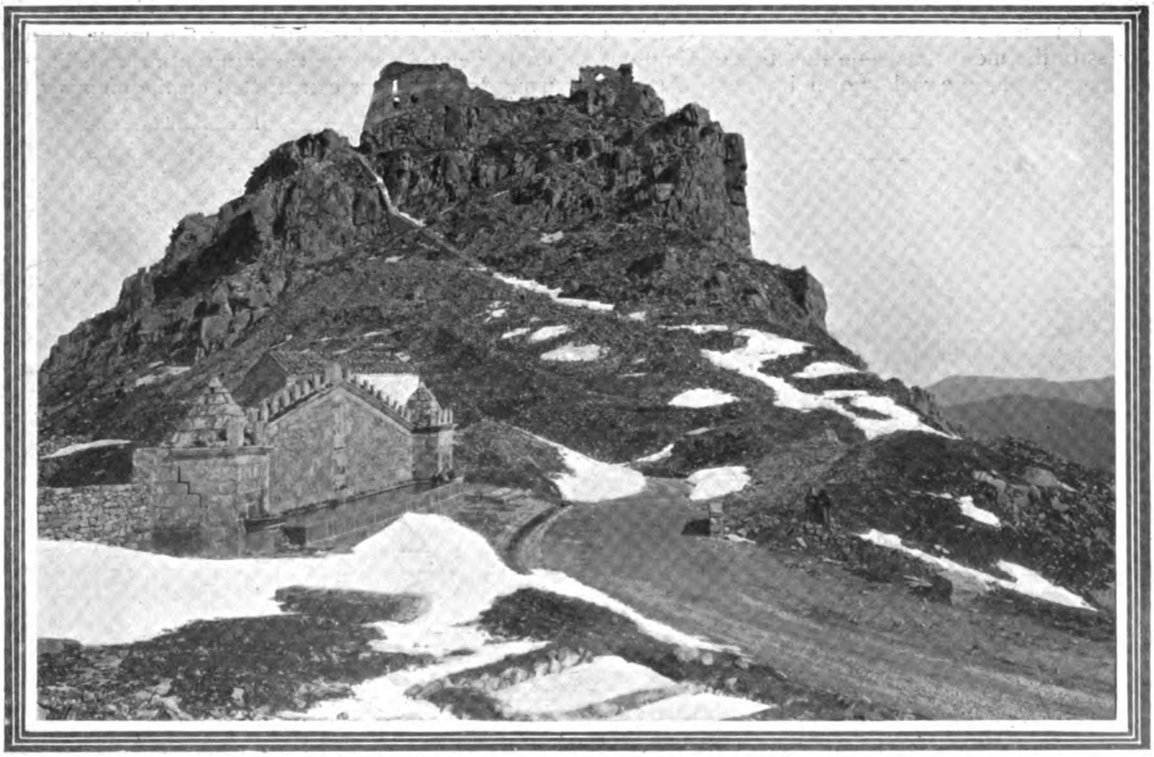
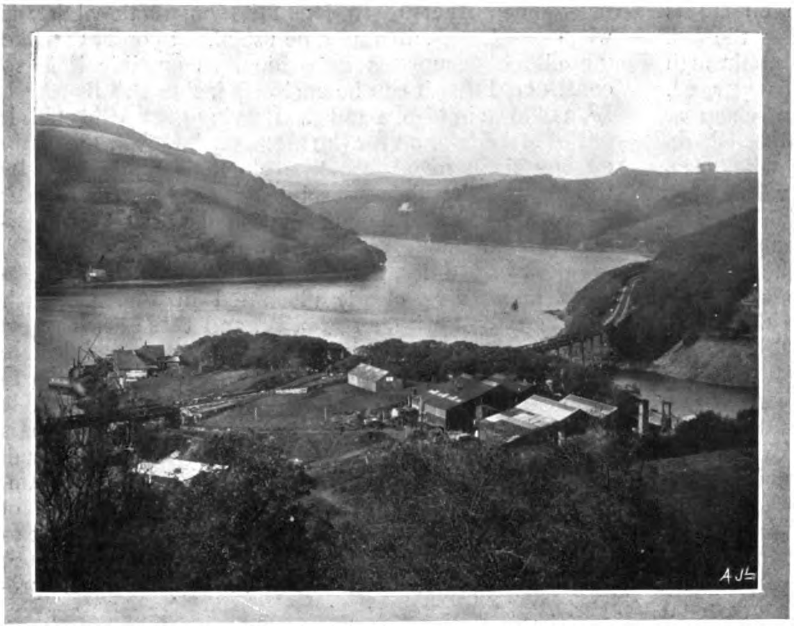


THE TARGA FLORIO RACE IN SICILY.—The ruins of the Castle of Geraci-Siculo.

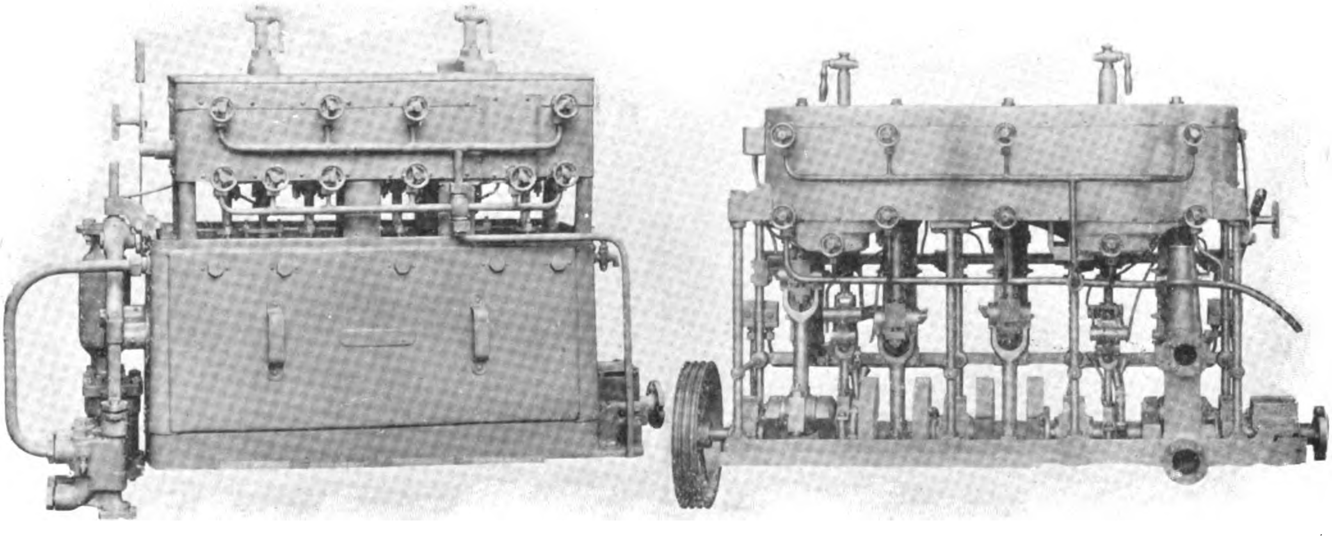
THE SIMPSON AND STRICKLAND STEAM LAUNCHES AND MOTOR BOATS.

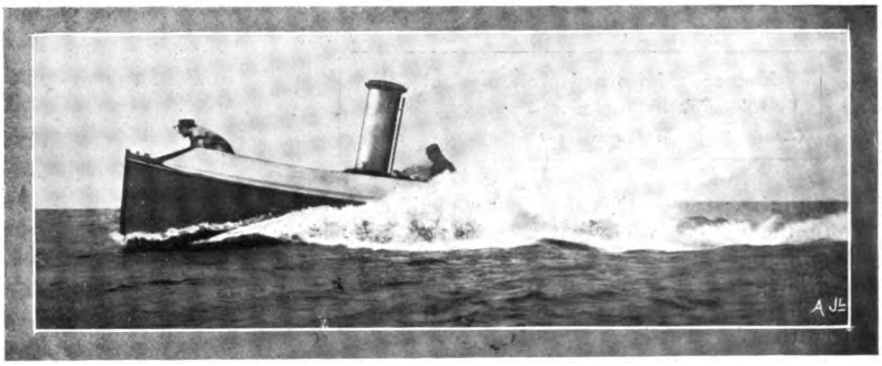
IT is always an excellent sign of the healthy growth of any new industry, when one after another of the large firms, who have already made their names in some kindred and parent engineering business, begin to take an active part in its development. Already such names as Thornycroft and Yarrow are closely associated with the progress of the motor boat, and now that of Simpson, Strickland, and Co.—the well-known builders of steam yachts and high-speed launches—can be added to the list.


A view of the picturesque estuary at Dartmouth, showing the situation of Messrs. Simpson, Strickland, and Co.'s yacht-building works.

The firm have for some time devoted a good deal of study to the application of internal-combustion engines to marine work, and have kept closely in touch with all that has been going on in the automobile world. They have already taken up the manufacture of petrol motors of 8, 16, and 32-h.p. respectively, these engines having 1, 2, or 4 cylinders of $4\frac{3}{4}$ ins. bore by $5\frac{1}{2}$ ins. stroke. Their experimental work, in this direction has, however, not yet been quite completed, for the intention is to make a very important feature of motor boats, and to equip them with engines that can work on a safer fuel than petrol. It is, perhaps, but natural that a firm which has been able to obtain such excellent results with steam, and have done so much to render it effective, economical, reliable, and durable for marine work, should be very exacting in their requirements, and should wish to be thoroughly convinced of the all-round merits of any new type of power generator before deciding to adopt it on a large scale. But it is, on the other hand, just such manufacturers as these that are best qualified to make motor boats an unqualified success.

We recently had the pleasure of visiting their Dartmouth works, a portion of which are visible in one of our accompanying illustrations. They are extremely well equipped for the manufacture of the boats themselves, as well as of the entire propelling mechanism. Every part is constructed on the premises from the


Views of the "Cross" quadruple expansion 4-crank steam engine, which is built by Messrs. Simpson, Strickland, and Co., at Dartmouth. The engine on the left is of the "closed-in" type, and that on the right of the "open" type.



A 30-ft. yacht's launch, built by Simpson, Strickland, and Co., which in 1900 attained the record speed, for boats of this length, of 19 knots per hour.

raw material, and—both in design and finish—thoroughness struck us as being the prevailing note. Our other illustrations show a special type of quadruple-expansion steam engine of which (amongst several others) they have built many, and also a 30-ft. launch driven at full speed by one of them. The engine, which is extremely well balanced, and is either of the "closed-in" or "open" pattern, has four cranks, two sets of piston-valves, and can run at very high speeds. The successes scored by these makers, in the Reliability Trials at Southampton last year, are evidences to the degree of perfection attained by them with steam, two out of the three gold medals having been awarded to them as well as special awards.

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Some Unsolved Problems in Motor Engineering.

On Wednesday evening of last week, the discussion following upon Lieut-Col. R. E. B. Crompton's paper on this subject was concluded at the Royal United Service Institution, and a large number of members of the Automobile and Cycle Engineers' Institute expressed their views on many of the points raised in the paper. For the most part the speakers were either those who delight to criticise adversely anything or everything that is now included in the standard practice of motor car makers of the day, or those who can avail themselves of such opportune occasions for bringing their own new devices before the notice of the public. There were comparatively few well-known designers of standard vehicles present to defend the accepted methods of the day. Consequently, the most useful remarks—apart from some of a purely general nature—were, perhaps, those made by Mr. Coventry, of the Great Western Railway, who was able to speak with very considerable authority after the enormous amount of experience that he has now had with various types of commercial vehicles. It is unfortunate that there should have been so strong a tendency, at this first discussion of the Automobile and Cycle Engineers' Institute in London, in the direction of the theoretical and academic, rather than the thoroughly practical, but doubtless the very nature of the paper gave the hypercritics their chance. Thus, for instance, there was a fairly strong gathering of electrical engineers present—most of whom have, themselves, done nothing towards the perfection of electrical apparatus on modern cars—and they were apparently just as unanimous in condemning the electrical equipment now employed, as many old-fashioned mechanical engineers always are in condemning all types of transmission gear, regardless of the fact that some of them *do* "work."

THE TARGA FLORIO RACE IN SICILY.—A double turning in the mountain heights.

REVIEWS OF BOOKS.

Motor Vehicles and Motors.—Vol. II.

By W. WORBY BEAUMONT, M.I.C.E., M.I.M.E, M.I.E.E.

(*London: Archibald Constable and Co. Price 42s. net*).

IT is with the purest satisfaction that we hail the appearance of the second volume of Mr. Worby Beaumont's great work on automobilism and automobile construction. There can be no doubt that it is far the most thorough, comprehensive, and satisfactory book on the subject that has yet issued from the press, whether in this country or any other, and every Englishman connected with the automobile movement will be at one with THE AUTOMOTOR JOURNAL in feeling a certain amount of reflected pride in the fact that it has fallen to an English consulting engineer to produce this splendid text-book. The work is likely to appeal to our readers in particular, as the subject-matter is treated with the care, accuracy and thoroughness which appeals to them, while in addition they are specially able to carry the study of the various topics further by following up the references which Mr. W. Worby Beaumont so copiously supplies, for he has, over and over again, referred his readers to the columns of THE AUTOMOTOR JOURNAL for further details. When we say "for further details" we do not for a moment suggest that Mr. Worby Beaumont's chapters are in any degree incomplete. On the contrary, the extraordinary correctness of detail with which he has dealt with such a variety of different subjects, and the remarkably good illustrations which characterise so many of its pages, are among the marvels of the book. But large as the volume is—and the actual letterpress covers some 659 quarto pages—the work would have had to be much more voluminous had he not in every case had to apply perforce the principle of leaving out almost everything that could be omitted.

It is a tremendous testimonial to the marvellous expansion of the automobile industry which the world has seen since Mr. Worby Beaumont's first volume issued from the press, to find that this second volume, which he thought might merely consist of a sort of appendix (comprising some supplementary chapters and engravings)—when he first contemplated writing it, soon after the second edition of its predecessor has appeared—has grown and grown to its present ample proportions.

The first volume comprised what may be termed the principles of automobilism—the general considerations involved in the design and construction of a self-propelled vehicle, its historical development, and the historical retrospect dealing with the predecessors of the modern movement, the old steam cars. To this was added careful descriptions of the most representative types of vehicle of that day—six years ago.

The second volume is quite different. The historic presentment of the subject having been adequately dealt with in the former volume, the subject is (probably to the relief of a good many) omitted entirely from the present work, which in the main consists of descriptions, —needless to say, as we have already remarked, highly workmanlike and accurate descriptions—of the principal existing builds of petrol cars, and in this way constitutes a real second volume and in no respect whatever a mere third edition. Commercial men, too, will no doubt find the exhaustive chapter on the cost of motor transport provide valuable data and principles which they may apply when considering the application of the automobile to regular route service, in which there is special reference to the cost of running motor 'buses, one of the more burning commercial questions of the day.

Several important chapters on more theoretical considerations, based on data which the experience of recent years has furnished, such as the chapters on "Power, Speed, and Tractive Effort," and on "Vibration and Turning Effort," "Overturning and Skidding," "Engine Dimensions, Piston Displacements, and Mean Pressure," of high value and interest to the engineer, are also included, while the data and general observations given on materials, especially steels, employed in car construction, are particularly suggestive and instructive.

Neither these, however, nor some other features in the work, can be expected to be absolutely up to date. The writing of a work with such a scope as this involves a perpetual struggle to keep abreast of a movement that is growing much more rapidly than anyone can write about it, and that, naturally enough, has given rise to a few solecisms, one of which may be quoted by way of illustration:—

> "Mr. Napier has made some cars with 6-cylinder engines, which are of much interest, and a large racing car of the same type, of about 80-h.p. The latter car is provided with only two forward speeds, the engines being relied upon to meet all intermediate requirements."

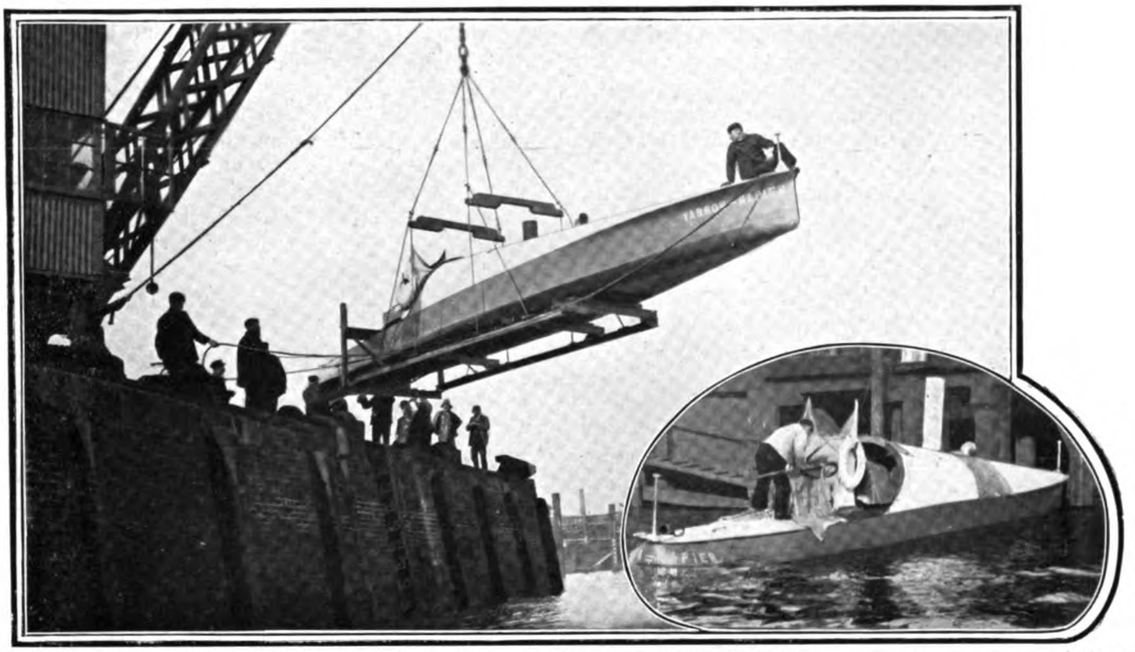
Pages 244 to 252, together with four large plates, are devoted to describing the Napier cars, and it is only by way of an afterthought on the last page and three words on the first page that the 6-cylinder touring cars are mentioned at all. Similarly, too, no reference is made to any other 6-cylinder engine than the "Belsize" model. Considering the way in which the 6-cylinder controversy has for some months been raging and the number of 6 and even 8-cylinder cars now on the market, this would strike the novice who neglected the time factor in the compilation of the treatise as rather ancient and very meagre history, were it not for the accompanying reference to THE AUTOMOTOR JOURNAL for the year 1904.

Most of the criticisms which the work might theoretically invite are therefore inadmissible, as they are evidently due to this same cause. Thus there is at least one vehicle mentioned which is now practically off the market, though at one time it represented the most advanced practice. Nor do we fancy that if Mr. Worby Beaumont were re-writing the work now, he would devote quite so much space to, or, in fact, treat quite so much *au grand serieux*, the electric vehicle. Incidentally, it may be observed that of the cars illustrating this branch of the subject, one was broken up in the year 1903, and that two were not built by the firm to which they are attributed.

In the useful chapter "Engine Dimensions, Piston Displacement, Mean Pressure," we fancy, however, that the table given would be more generally intelligible to the interested reader if, instead of multiplying the cylinder capacity per minute by 2, it had been divided by 2, for the figures would then correspond to what most people think of as the piston displacement in an "Otto" cycle engine, *i.e.*, the amount of mixture sucked in per minute.

But these are trifling matters, and do not to any real extent detract from the immense value of the book as the most comprehensive and reliable work on motor car construction which has yet appeared.

"YARROW-NAPIER."—THE LATEST HIGH-SPEED MOTOR BOAT.

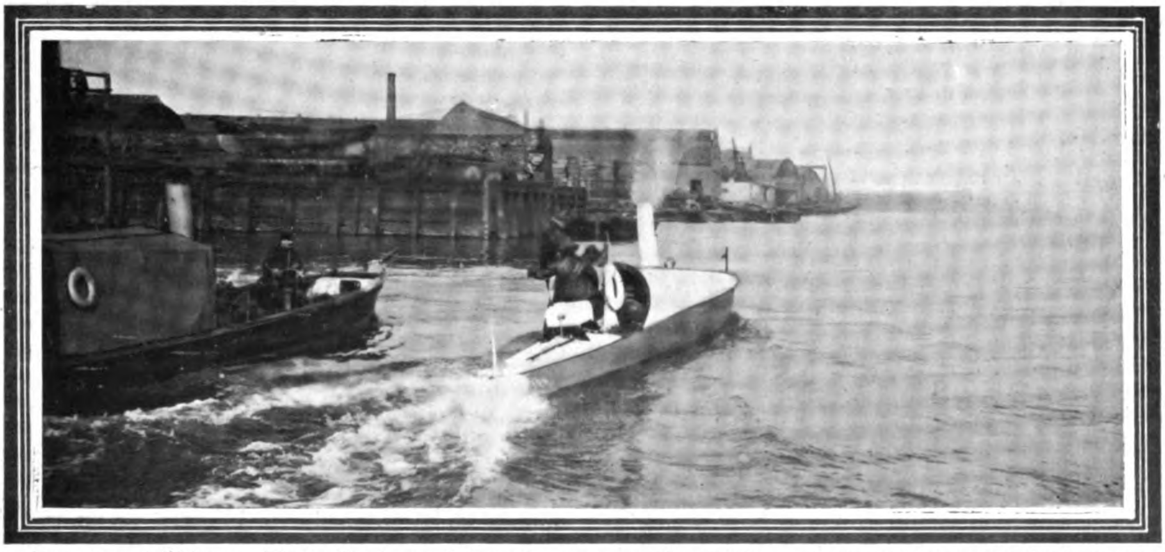


The latest racing motor-boat, "Yarrow-Napier," which replaces "Napier II" of last year. She has been unofficially timed to a mean speed of 27·2 knots, which is over 31 miles per hour, and is already on her way to Monaco for the forthcoming races. Our photographs show the boat being "launched" at the Yarrow works, and afloat in her natural element.

WITH the boating season now rapidly approaching, makers are already launching their new crack craft which are to represent them in the forthcoming sporting events.

Among these is "Yarrow-Napier," which takes the place of the famous "Napier II" of last year, of which a very fully illustrated description appeared in THE AUTOMOTOR JOURNAL of March 11. Her general lines are exactly similar to the old boat, but the hull is constructed of wood, on the Saunders sewn principle, instead of steel. Our illustrations show the general lines of the hull both above and below the water-line, and it will be noticed that the bottom is quite flat. A somewhat more finished appearance is obtained with this boat than with "Napier II," owing to the fact that there is a permanent wooden hood over the engines instead of the canvas cover formerly used. Another small detail which has been dispensed with is the spray guards, but the bow has a more pronounced flare, which answers the same purpose in a neater manner.

Two 75-h.p. engines are employed to drive the boat, each being coupled to its own propeller. Only one



Another view of "Yarrow-Napier," taken while under way. At first sight, anyone would imagine the boat was a "steamer," not only because of the high funnel but on account of the steam actually issuing from it. This steam is caused by the circulating water which is brought into contact with the exhaust gases in order to cool them.

of these is fitted with a reversing gear, however, and when getting under way it is only necessary to start one engine by hand because the motion of the idle propeller through the water develops sufficient turning effort to enable the second motor to be started on the switch. Both engines are of the 4-cylinder type, they each have their enamelled aluminium water-jackets cast in one piece with the upper half of the crank-case, and use cast-iron liners for the cylinder walls. A single bearer runs fore and aft down the centre of the boat for supporting the inside engine-feet, the outside supports being attached directly to the hull. The two engines run in opposite directions, and are so arranged in the boat that their exhaust-valve sides are adjacent. A large exhaust-box, through which the cooling-water passes in contact with the gases, is provided to form a silencer, and the exhaust, after passing through this, can either be discharged under water or through the funnel. This funnel makes the boat look very much like a steam craft, and the delusion is emphasised when exhausting to the atmosphere, owing to the steam which arises from the heated water.

All the general arrangements are very similar to those in "Napier II.," and it will be noticed that the same position has been adopted for the steering-wheel on the after deck, and that a seat is provided for the skipper over one of the petrol tanks. No officially-timed tests have yet been carried out, but during some trial runs her mean speed is given as 27·2 knots (31·2 m.p.h). At this speed, the engines were running normally, and we understand from Mr. S. F. Edge that the boat seemed capable of working under those conditions for an almost indefinite period.

In fact, so satisfied was he with the trials that he has had the boat shipped off to Monaco without delay, and her performances in English waters have, therefore, been of the very briefest duration. The overall dimensions are as follows:—Length 12 metres, beam 5 ft., draught of hull 9 inches, and draught including propellers 2 ft. 6 ins.

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THE "AUSTIN" LUBRICATION SYSTEM.

LAST week, we described the "Austin" exhaust device which is being fitted to all the new "Austin" touring cars, and now we are able to give some particulars of another feature which is also being incorporated by Mr. Austin with the object of entirely overcoming any ordinary "exhaust troubles." We refer to the lubrication system, by which, it is claimed, that smoky exhaust and foul ignition-plugs are rendered practically impossible. The oil is forced from the main supply tank, which is fixed to the frame near the engine, by a small gear-driven rotary pump to a sight-feed distributor on the dashboard, and thus it is caused to flow to the pistons and to all the bearings of the engine. Subsequently it finds its way down into wells formed in the base of the crank-chamber, and thence it flows back again through filters to the supply tank. Since the driver can always ascertain at a glance whether the pump is working properly or not, there is practically no question as to whether the correct quantity of oil is present inside the crank-chamber.

* * * *

A Novel Point in Motor Car Law.

ONE Lionel Anderson was summoned before Mr. D'Eyncourt for having no lights on his motor car after dark, and for having no light to illuminate his identification plate in the rear—the usual police illegality of making two charges out of the same occurrence. Fortunately he met with a sympathetic magistrate who had a humorous eye for the inconsistencies that have been left in the Act and the Local Government Board Regulations. The regulation under which the summonses were taken out states:—

> "(7) (i) The lamp to be carried attached to the motor car, in pursuance of Section 2 of the Act of 1896, shall be so constructed and placed as to exhibit, during the period between one hour after sunset and one hour before sunrise, a white light visible within a reasonable distance in the direction towards which the motor car is proceeding or is intended to proceed."

Mr. D'Eyncourt held that as the car was at rest and not proceeding, and nobody knew in what direction it was going to proceed, it could not commit the offence of not having a white light visible in the direction in which it was proceeding or was intended to proceed, and the summonses were dismissed accordingly.

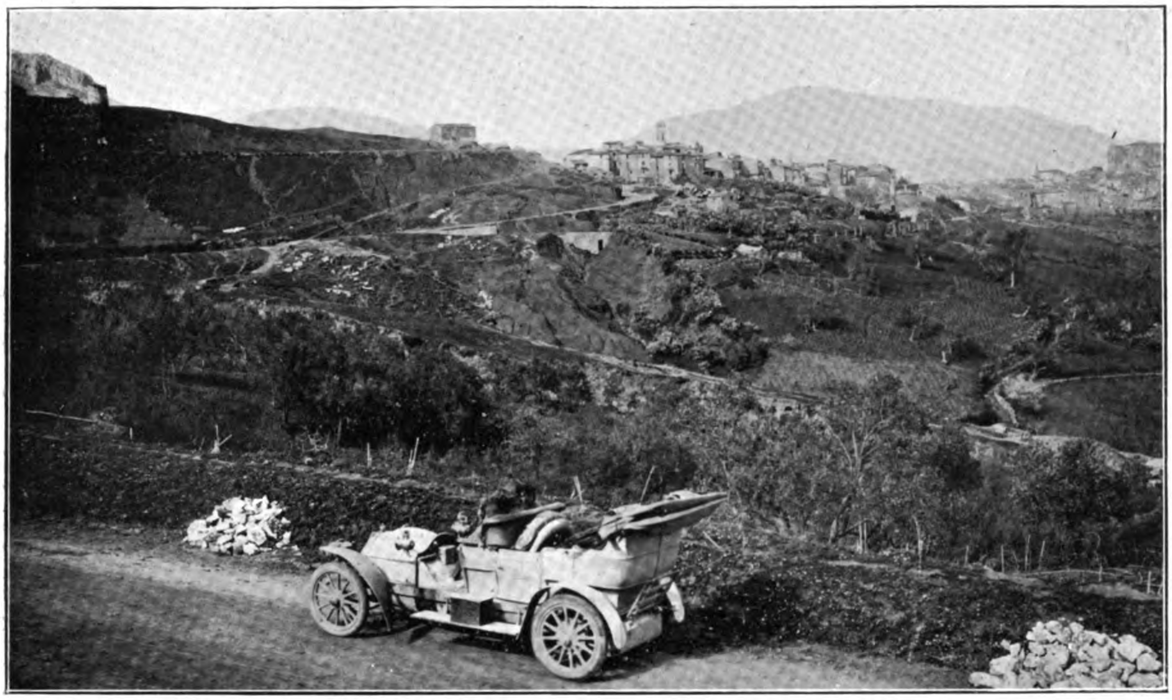
The Results of Bad Example.

WHEN a motor 'bus goes wrong everybody and everything is so astonished that they go wrong likewise and a regular chapter of accidents results. At least this is the conclusion to be drawn from certain phenomena which were observed recently near the corner of the Old Bailey. A "Union Jack" motor 'bus, making its way westwards, collided with a van, the driver of the van being thrown from his seat and sustaining injuries. A boy cyclist was so struck by such an unwonted occurrence that he promptly fell off his bicycle, and he too sustained injuries, while at the same time a philosopher of the pavement, who was viewing these occurrences with curiosity and preparing to record them in a note-book, put his foot through an open coal-hole that was preparing to receive a charge of fuel from a yawning sack, and received injuries to his leg, while another astonished spectator of these catastrophes was run over by a horse-drawn omnibus and was slightly injured in the same part of his anatomy as the gentleman who mistook the open coal-hole for a portion of *terra firma*.

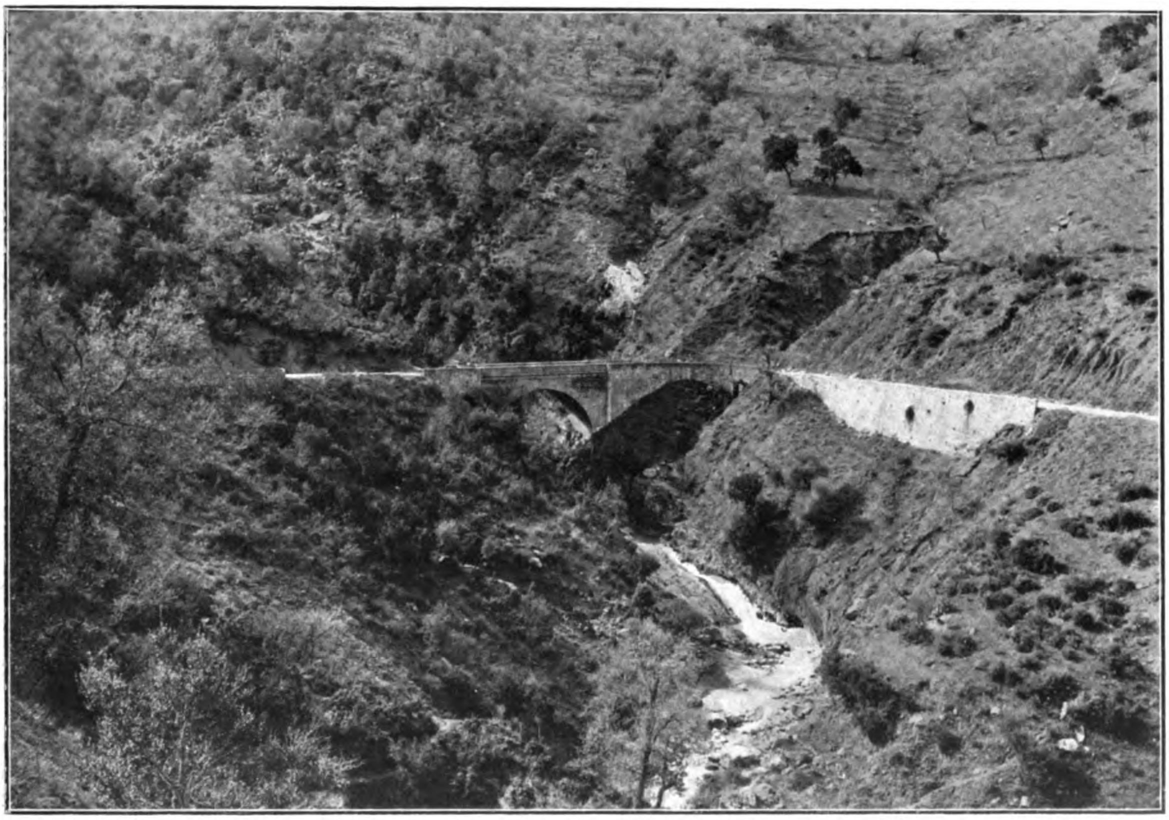
Chasing the Horse by Car.

IN the neighbourhood of North Leach recently, when one of the Automobile Club trials was being conducted, no less than three horses ran away at once. The driver of one of the cars, however, gave a lift to their owner, and finally, by the co-operation of the car, the recalcitrant animals were headed off, and brought back to their labours. The horses of North Leach have since held an indignation meeting, which, it is understood, will probably lead to the passage by the parish council of anti-automobile resolutions at their next meeting.

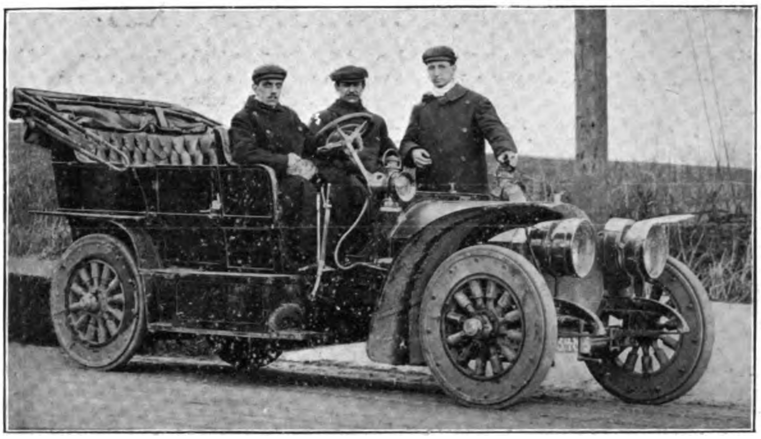
RACES, RECORDS, AND TRIALS.



THE TARGA FLORIO RACE IN SICILY.—The road upon approaching Castelbuona (seen in the distance).



THE TARGA FLORIO RACE IN SICILY.—A striking scene in the mountains near Isnello.



RESILIENT WHEEL TRIAL.—The Pradeau wheels now undergoing a 4,000-mile test, on a 24-h.p. Car, under the observation of the A.C.G.B.I.

A.C.G.B.I. Tyre, Lamp, and Speedometer Trials.

THE following is a summary of the performances of the various competing devices during last week—March 5th to 10th—as officially supplied to us :—

Cars.—Dennis car—non stop.

Tyres.—Collier tyres (3 sets)—1 cover replaced owing to bad cut.

Speedometers.—Vulcan, Jones, Gratze and Cowey.—Non stop.

Warner.—Adjustment to driving gear and replacing the shaft.

Lamps.—Worsnop.—Relighting off-side lamp and choked near-side lamp.

Polkey.—Jolted out twice.

Ryta and Hoult (tail lamp).—Non stop.

Metallic Mirrors (tail lamp).—Went out twice.

Worsnop (tail lamp).—Went out three times.

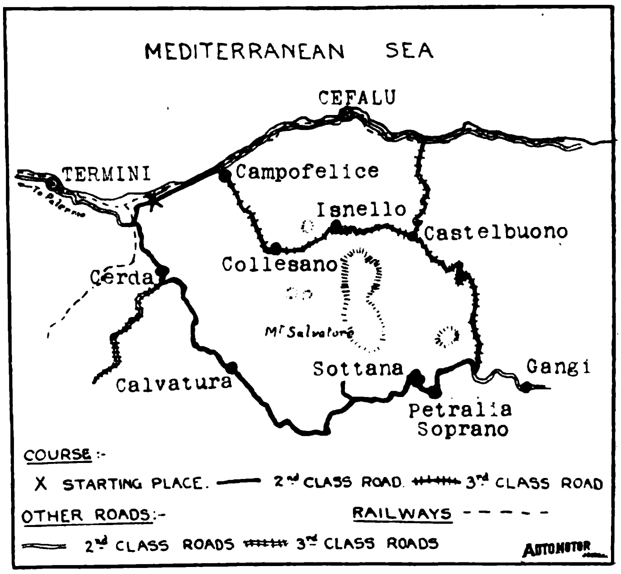
Pradeau Spring Wheel Trials.

AFTER travelling 71 miles, the car on which these wheels were fitted sustained a broken axle. Since then, however, the club report records no mishap, and the test, which started on Tuesday the 6th inst., has been going on successfully. We give a photograph of this set of wheels, fitted to the car on which the trial is being made, as briefly described by us last week. Each wheel has, it will be remembered, a double rim enclosing radial springs which rest in sockets provided for them in the outer ends of the spokes.

A.C.G.B.I. SPEEDOMETER TRIALS.—View of the mileage recorder which is entered in conjunction with the Vulcan Speed Indicator in order to conform with the rules. This instrument is fixed to the wheel-hub.

The Targa Florio.

THIS race in Sicily for tourist cars, costing up to a maximum of £800, promises to be one of the most trying ordeals of the year. Full particulars of the event have already been published in THE AUTOMOTOR JOURNAL, and by way of supplementing these we publish this week some striking photographs taken recently during a journey over the course, together with an outline map of the road selected for the race. Those taking part in the contest will assuredly have a unique experience, and should have many a tale to tell thereafter. That the trial will be a severe one may be gathered from the fact that *none* of the roads selected are classed as "first-class," and more than half are "third-class" roads, these comprising the course through the more mountainous district after leaving Petralia, rising to a height of over 4,500 feet.



Map of the course for the Targa Florio Race in Sicily for Tourist cars, which is to take place on May 6th.

Théry, who has been over the course, does not think it will be possible to average a higher speed in the race than 55 kiloms. per hour, and owing to the unusual severity of the test, it is proposed that the cars shall only cover the circuit twice instead of three times, as originally contemplated. Every effort is being made by the Italian organisers to induce foreign makers to send cars over to participate in the race, for which already a number of the leading Italian makers have entered. Reductions in tariffs are announced in all directions as a tempting bait, these including 60 per cent. off the Italian railways,

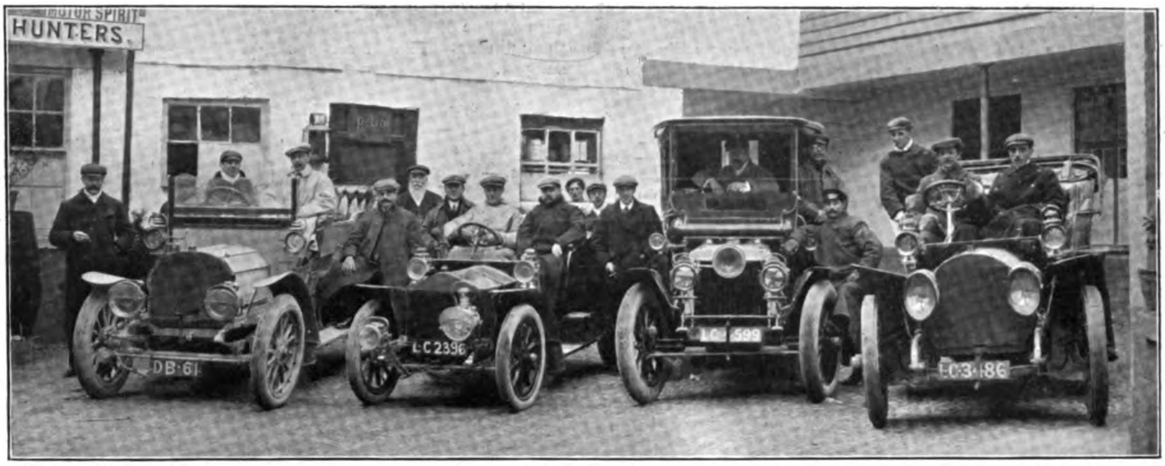


Photo by Argent Archer.

A.C.G.B.I. TYRE, SPEEDOMETER AND LAMP TRIALS.—The cars at Daventry, on the 9th day, including the 24-h.p. Fiat (on the right), fitted with the Pradeau wheels.

75 per cent. off the Sicilian railways, 40 per cent. off the steamboat charges to Sicily (in some cases 75 per cent.), 10 per cent. to 20 per cent. off hotel tariffs, in addition to free admission to all sorts of *fêtes* which are in course of preparation in connection with the event. May 6th is the date selected for the actual race.

Electric Vehicle Trial.

In principle, the A.C. de France have, upon the proposition of the Chambre Syndicale de l'Automobile, adopted a resolution in favour of organising a competition for vehicles propelled by electric accumulators.

Resilient Wheel Trial in France.

The date fixed for the Resilient Wheel Trial in France, organised by *L'Auto*, is April 18–26. The daily stages which the competitors will have to cover total up to 2,128 kiloms., the route selected being from Paris to Nice and back *viâ* Dijon, Valence, and Marseilles.

More French Tests.

Several new contests are proposed by the A.C. de France for touring cars, amongst the most interesting being those for lamp equipments and prevention of smoke from the exhaust.

Nice Speed Events.

After obtaining permission from the authorities to revive the speed races on the Promenade des Anglais, and on the Turbie Hill, it is now stated that the Nice Automobile Club propose abandoning them for this year, owing mainly to lack of entries. The club propose to substitute a Tourist Car Contest.

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MOTOR CYCLING.

International Cup Race (Motor Cycles).

The entries which have now been received for taking part in this race, on behalf of Great Britain, are the two machines by Collier and Sons, the one by C. B. Franklin, and in addition two machines by H. Mogridge, one by T. Silver, and two by A. Westlake. Entries do not close until March 31st. There appears to be a probability of the race itself in Austria being postponed until July 8th.

Motor Bicycle Exhausts.

At last it would appear that a general attack is to be made upon the free exhaust of the motor bicycle. Last week The Automotor Journal welcomed the action of the Auto Cycle Club in taking this very important question in hand, and now we see that the touring commission of the A.C. de France have decided to approach the Prefect of Police, with the object of the authorities taking action against owners of motor bicycles who use their machines with free exhausts, or in which the silencer is ineffective. The suppression of this very grave nuisance will tend very considerably, we think, to eliminate the very widespread prejudice which has been created by free exhaust motor bicycles careering round the country in large numbers.

Motor Cycle Records.

Last week at the Parc des Princes Track, Paris, a triple attack was made on the existing "100 kiloms." and "hour" records by Anzani, Pernette, and Thomas. Anzani and Pernette rode Alcyon machines weighing over and under 50 kilogs., respectively, while Thomas made his trial on a similar make under the one-third litre category. Anzani was unfortunately thrown in his thirteenth round, and so was unable to complete his attempt. His fourth round, however, was made at the rate of 106·5 kiloms. per hour. Pernette lowered Giuppone's record on a Peugeot of 1h. 6m. 36⅖s. for the 100 kiloms. to 1h. 3m. 51⅕s., and accomplished 94·73 kiloms. in the hour, as compared with the 90·360 kiloms. covered by Giuppone. Similarly Thomas lowered Cissac's records (also on a Peugeot) of 1h. 6m. 46⅘s. for the 100 kiloms. to 1h. 5m. 27⅕s., and finished 91·665 kiloms. against Cissac's 89·895 kiloms. in the hour.

The Motor Cycling Club, which last year disputed the right of the Auto Cycle Club to compel other motor cycling clubs in the country to run motor cycling events under a permit from the Auto Cycle Club, and were suspended for their "contempt," have now, we are pleased to learn, come into line with the Auto Cycle Club, and we hope for the future to see nothing but harmony reigning between these two bodies in like manner to the rest of the motor cycling associations throughout the country. The Motor Cycling Club, having acknowledged the authority of the Auto Cycle Club, all the former's events this year will be officially recognised, and already permits have been issued for the leading fixtures which the very energetic Motor Cycling Club have determined to carry through. The suspension of Mr. J. Van Hooydonk has also been removed, and this well-known rider is once more free to take part in events.

The Southern Motor Club inform us that they are now prepared to send entry forms, with gradient and map of district in which Coast Hill, Westcott, near Dorking, is situated, to intending competitors for their Open Hill-Climb for motor cycles and tricars on April 7th next. Application should be made to the Hon. Sec., Sports Committee, 29, Grantham Road, Clapham, S.W.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

FOUR CYLINDERS *versus* SIX CYLINDERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I see a suggestion in your issue of March 3rd from a correspondent who wishes to run a 4-cylinder against a 6-cylinder, and the trials which he suggests are as follows:—

1. Horse-power, say 40.
2. Minimum number of revolutions of engine per minute, car standing.
3. Maximum number, ditto.
4. Slow running of car on top gear, clutch not slipping.
5. Fastest speed on the same gear.
6. Ability to take hills on same top gear.
7. Silence when running on top gear.
8. Cars to be of the same total weight; differences to be made up by ballast.
9. Cars to run between two observing cars about 100 yards apart.
10. Petrol consumption to be taken.
11. Engine to run all the time, and not allowed to be switched off running down hill.

Test to be over 100 miles of give-and-take road.

I shall be pleased to run a 6-cylinder Napier car under the conditions set out, and the distance can be made as much greater as the 4-cylinder believer-in likes. I hope we shall see a 4-cylinder advocate come forward and really take the matter up in a scientific way, and let the world see the result.

Yours truly,
March 7th. S. F. EDGE.

BRITISH OUTPUT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Exception must be taken to the quite unwarrantable remarks and inferences in Mr. S. F. Edge's letter of your last issue. As a looker-on, I wish to ask by what right he appropriates to himself the position of inquisitor upon this, as upon other matters.

As a self-constituted collector of figures that he wishes to be "exceedingly accurate," to presumably benefit the British industry, is it surprising that, with his usual conspicuous tact, he does not find firms complaisantly supplying rival concerns with private information of their business?

In how many instances in other trades are such particulars given, save to disinterested compilers of statistics? He admits two or three firms declined to docilely follow his invitation. Doubtless, to an independent and properly accredited quarter, absolutely free from the reproach of trade interests, the particulars would have been readily given. But because firms choose to exercise their right, it appears to me supremely ridiculous that unworthy deductions should be publicly made and conclusions invidiously come to by Mr. S. F. Edge or other aspirants to erudition.

What I wish to protest against is the general principle of the matter. If Mr. S. F. Edge's requests are not favoured and played up to, by all means let his zeal for the general good suffice for his reward.

The alternative course he adopts is neither new or edifying. Is it, therefore, surprising that the Sir Oracle rôle falls flat? Moreover, with independently compiled figures, no one can retort that self-prominence underlies endeavours however well-meant and characteristic—the assumption of regret and injured innocence notwithstanding. Purity of motive would be unassailable, and I fail to see why Mr. S. F. Edge or anyone else should needlessly lay themselves open to uncharitable rebuffs by those firms who evidently were indifferent to assisting at the desired consummation.

Obviously it is exceedingly doubtful, withal, if such extravagant and impartial contributions as his last will promote good feeling and further those interests he has presumably so much at heart.

Yours faithfully,
NO AXE TO GRIND.
Birmingham, March 12th.

THREE YEARS' GUARANTEE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I find your correspondent in the last issue makes two misstatements, one in regard to the price of the 6-cylinder Napier, which is £1,050 and not £1,250, and the second in regard to the b.h.p., which is 48 and not 30.

As an owner of a 6-cylinder motor, however, I am afraid I prefer a guarantee of three years to an indefinite guarantee that the bigger the cylinders the better the car, as your correspondent wishes to suggest.

Yours,
March 10th. OWNER.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With reference to the figures I gave on the question of the three years' guarantee, Mr. Letts, of Messrs. Charles Jarrott and Letts, writes me that the price of the 40-h.p. De Dietrich is £1,000 and not £1,110. My figures were taken from a well-known motor car journal in a list entitled "A Guide to Buyers." On the rectified figures given by Mr. Letts their price per b.h.p. would work out at £19 10s. (or £2 better per h.p., roughly speaking £100 on the total cheaper than I have stated in my letter). Or again, the comparison with Mr. Edge's car would be that Mr. Edge should charge at the same ratio £585, or he is in comparison £665 dearer.

Yours faithfully,
March 9th. D. M. WEIGEL.

[It is evidently not our "Buyers' Guide to the Touring and Pleasure Cars of 1906," to which Mr. Weigel refers above, for in this production (AUTOMOTOR JOURNAL of February 17th, page 195) the 40-h.p. De Dietrich chassis is given as being price £1,000 with 10 ft. wheel base, and £1,040 with 10 ft. 8 in. wheel base.—ED.]

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Referring to your correspondent's letter on this subject in your issue of March 10th, whilst it is exceedingly kind of him to point out that the Napier 6-cylinder will obtain more money than cars of similar horse-power of foreign manufacture, we do not wish credit where it is not deserved, and the price of the standard 40-h.p. 6-cylinder Napier is £1,050 not £1,250, as stated by your correspondent, and the b.h.p. is 48, not 30.

If he would correct these figures his arguments might then be of more utility, and whilst thanking him for his efforts, we feel quite able to put forward points in our own favour without your correspondent, who writes fallacious arguments based on incorrect figures, to prove British motor cars superior to foreign.

We remember your correspondent not so long ago trying to argue that foreign cars were better than British, and we cannot help feeling that the British cause would be better without allies who change so rapidly from pro-Foreign to pro-British.

Yours truly,
S. F. EDGE, LIMITED,
March 9th. H. T. VANE, Secretary.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With regard to a Mr. D. M. Weigel's letter in your issue of March 10th, I enclose you herewith conversation that I overheard some years hence, following out Mr. Weigel's theories to a logical conclusion:—

Customer: "12-inch stroke, why do you have such a long stroke?"

Salesman: "Oh, it gives you a very much larger 'cubical capacity,' and if you compare our figures with those of our rivals who only have a 10-inch stroke, you will find that our cubical capacity is very much greater in value than theirs."

Customer: "Is this long stroke of any use, or any real test as to the value of the car?"

Salesman: "Not the slightest, Sir, but look what lovely figures it gives as to cubical capacity."

Customer: "Might the engine itself conceivably be better with less cubical capacity?"

Salesman: "Certainly, Sir, but ever since Mr. Weigel laid down the principle of selling and buying cars on their 'cubical capacity,' the increase in the 'capacity' has been enormous, and we are not going to be left behind."

Customer: "Do you give a three years' guarantee with your cars?"

Salesman: "No—but look what a beautiful 'cubical capacity we give!"

Yours truly,
March 12th. J. LAMBERT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Would you allow me space to ask Mr. Weigel in what way he imagines that the British industry would benefit by Mr. Edge "bringing his prices down to the level of other makers and in proportion thereto."

If Mr. Edge were able to do such a thing, it appears to me that other makers would have to offer an equally attractive car or do no business at all.

Furthermore, it would be interesting to hear why Mr. Weigel does not exploit a "one" or "two-cylinder" car of, say, 50-b.h.p. which would further emphasise his belief in the argument of "Horse Power for Money," which he is putting forward.

Mr. Weigel knows perfectly well, as do all others in the trade who have argued against the 6-cylinder, that, quite apart from price, it is at present the most suitable motor with which to offer such a guarantee, and the sooner its opponents can compete with Mr. Edge, the better for purchaser and industry alike.

Certainly the Napiers are very high in price, but buyers get a good deal more than mere horse-power for their money, and to my mind a standard of excellence is being set, which is the finest example to both British and foreign makers.

For my own part I doubt the wisdom of giving long guarantees, and should expect that such a practice will lead to trouble between seller and buyer.

Yours truly,
ARTHUR BROWN.

Luton, March 13th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I notice a correspondent has given some statistics of what maximum efficiency certain cars may reasonably be expected to give on a basis of cylinder capacity. If his calculations are anywhere near accurate as regards the other cars he mentions, he has conclusively proved the wonderful efficiency of the 6-cylinder Napier, as, although it has by far the smallest cylinder capacity, it gives over 50 per cent. more power for its size than any of the others. I give below the correct figures for the Napier, the rest are those given by your correspondent, arranged in order of cubic capacity :—

Napier ...	300	cubic inches give	48	brake horse-power.
Maudslay ...	380	,, ,, ,,	38	,, ,, ,,
Siddeley ...	430	,, ,, ,,	43	,, ,, ,,
Fiat	450	,, ,, ,,	45	,, ,, ,,
Itala	460	,, ,, ,,	46	,, ,, ,,
De Dietrich ...	510	,, ,, ,,	51	,, ,, ,,
Daimler ...	520	,, ,, ,,	52	,, ,, ,,

No wonder the 6-cylinder Napier cars with such efficiency sell well!

Yours truly,
B. JOHNSON,
Of S. F. Edge, Ltd.

March 10th.

STEAM AND ELECTRIC.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—A note in your issue of the 3rd draws attention to a new periodical which purports to have been born to meet a long felt want of the steam and electric carriage industries, and you, Sir, criticise the necessity.

No one having any acquaintance with your columns would treat your criticisms as journalistic prejudice, but they are, of necessity "editorial." May I, however, as one interested in the electric carriage trade cordially support your protest?

We shall be interested to hear what the manufacturers of steam cars have to say on the matter, but for our part, we see no need for any review to act as a "propelling power," nor do we need a "staff of efficient writers and advisers" to raise the electric vehicle in the estimate of the public. These, to judge by the leading article in the review in question, are its aims.

It is perfectly true that in these days the electric carriage receives but little attention from the automobile Press. It does not, however, take much perspicuity to discover the reason for this.

Two influences make for publicity in the Press—public interest and reciprocity.

There is naturally but little public interest in the technical characteristics and mechanical details of the electric carriage. No amateur drives one because it is much too dull work. There are no cranks and valves and cylinders and change-speed gears for the ordinary man to discuss. Nobody cares twopence whether the electric carriage has one motor or twenty, or whether it carries five accumulators or fifty, consequently we have no pages of correspondence on the subject. It *may* be a matter of doubt whether four cylinders or six promote efficiency, or lessen the innumerable ills which the explosion engine is heir to. So long as the petrol car remains a complicated collection of intricate mechanical parts mounted on a frame and set in motion for the pleasure of men who have a mechanical turn of mind, so long will dissertations on the merits and demerits of cars find a market. The electric carriage has passed out of this stage. It is driven month after month, year after year, by an ordinary professional driver. So ordinary a driver is he, indeed, that he has not even been given a foreign name. There is at present little left to discuss; and, in its own sphere and for its own purpose, it may be said to have reached finality.

You, sir, refer to the days when the electric carriage tried to do wonderful things; tried to be interesting, in fact. In the public interest you devoted many pages to record-breaking runs. Early numbers of THE AUTOMOTOR JOURNAL are full of descriptions of accumulators with wonderful names, and still more startling characteristics. Happily, perhaps, neither the names nor the properties have survived the eliminating trials of time. These days are passed, and so has public interest.

What we have called "reciprocity" may sometimes lead to the mention in the Press of matters not of public interest. This is natural. A newspaper must be run on business lines, and an editor is bound to support those who, by filling his advertisement columns, help his paper to live.

The system may at times be a little crude, and the advertising staff may be injudicious, but they have to live, and even an editor may be excused if he feels less love for those who exist without his help than for those who need his parental care. This again is human, and nobody complains about it. Why should they? The truth is that the electric carriage manufacturer to-day does not require the same kind of advertisement that the makers of petrol cars seek. The number of the former may almost be counted on one hand, whereas who can number the latter?

The London streets give sufficient emphatic publicity to the merits of the electric carriage. They are everywhere. Their very silence is their loudest *reclâme*.

As a manufacturer, I sincerely trust that public interest in technicalities and the necessity for advertising the rival merits of many systems may long be absent from the electric carriage business.

When the time comes, as it must, when one or other of these requirements will arise, we feel sure that the existing automobile Press will treat the subject as liberally in that day as it has in the past.

In conclusion, may we be allowed to say, "Save us from our friends?"

Faithfully yours,
THEODORE G. CHAMBERS,
Managing Director of
THE ELECTROMOBILE COMPANY, LIMITED.

March 12th.

ELECTION MOTOR CARS AND INSURANCE RISKS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We have all heard of the extent to which candidates at the recent Parliamentary Election benefited by the loan of motor cars, but this new use for the speedy car has had an aspect and a development which have not been previously mentioned, namely, the increased number of accidents and consequential claims under insurance policies. In fact, I have had a calculation made, and for the week from Saturday, the 27th January, to Saturday, the 3rd February, the additional accidents solely due to the election will cost us over £1,500 beyond our normal experience for accidental damage to car and third party claims.

As the cars insured, in the majority of cases, were loaned to friendly candidates who were not the owners, I have no doubt that we could have denied liability for about £1,000 worth of claims, but believing our policy should cover such an use of the car, we have decided to interpret our liability very generously.

Yours faithfully,
FREDK. THORESBY,
General Manager,
Car and General Insurance Corp., Ltd.

Feb. 26th.

MOTOR ENGINEERING PROBLEM.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In the published reports of the paper recently given by Col. Crompton before the Royal United Service Institution there are several statements which can hardly be allowed to pass without scrutiny. For example, the lecturer is reported as having said that "the 2-cylinder engine is now rarely seen even in small cars." Now anyone conversant with the motor industry knows that this is far from being the case. It can with safety be claimed that there is a greater number of 2-cylinder cars on the roads to-day than there are fours, not only so but at no time in the past have cars with this type of engine been turned out in greater numbers. Some of our largest manufacturers devote special attention to cars fitted with this type of engine, and at present one of the largest motor factories in Britain is solely devoted to their production, and such is the demand that a ready market is being found for an output of twenty vehicles a week.

The lecturer goes on to claim that four and even six cylinders are necessary in order to obtain elasticity of drive, even turning movement and durability of rubber tyres. From this the novice would naturally infer that a 2-cylinder car was non-flexible, ran with a series of jerks, and was heavy on its tyres, yet this is not so; 2-cylinder engines, as manufactured by the best engine builders, run with remarkable sweetness, and when fitted with a suitable fly-wheel it would baffle most people to tell after a 50 miles' run whether a 2 or a 4-cylinder engine was below the bonnet. An altogether inflated value seems of late to have been put on "an even turning movement" without due regard being paid to what is meant by the term. What we have to deal with is the effort exerted by the driving-wheels where they touch the ground, and we have to remember that between the drivers and the crank-shaft we have the axles, the differential, the cardan shaft (or the driving chains), the clutch, and the fly-wheel, that each of these is tending to keep the motion of the car steady, either by the energy stored in the moving parts or by the elasticity of the parts under stress, further that the whole mass of the moving car acts to this same end. The engine is giving off an uneven turning effort, it is true, but note the smallness of the time interval during which the fluctuations take place. At the nominal speed of 1,200 revs. per min. we get each complete revolution taking $\frac{1}{20}$ of a second, or a complete cycle in $\frac{1}{10}$ of a second, a period of time too small to permit of the fluctuation of effort from an up-to-date 2-cylinder engine reaching further than the fly-wheel.

Again, it is suggested by Colonel Crompton, that with two cylinders the tyres must suffer. That this is not so can most readily be shown by actual results. The writer knows of several instances of 2-cylinder 10–12-h.p. cars, seated for five persons, and used on ordinary roads, having been run for 5,000 and 6,000 miles on one set of tyres, but cannot recall a single instance of as good results being obtained on a four. Nor is this difficult to account for, because the life of a tyre of a given size is as near as may be, other things being equal, inversely proportional to the horse-power, and is in practice not found to be affected by the number of cylinders.

Having in the first place endeavoured to set aside the 2-cylinder engine, Colonel Crompton next directs attention to the "complexity of parts, costliness of manufacture, and increased risk of stoppage on the road," of the 4 and 6-cylinders, and deplores that English motor engineers are not striving after improvement in the way of greater simplicity and fewness of parts. The Colonel's desire evidently was to pave the way for an advocacy of the steam car, but it seems to the writer his arguments are far more telling on behalf of the properly designed and built 2-cylinder car. In this you have the great simplicity asked and the minimum number of parts to give trouble or to need adjustment, and at a moderate cost. The upkeep of such a car is very low, and for ordinary running need not exceed £50 a year, while such a car can be bought from £350 to £400, with any style of body desired. For the man of moderate means who wishes to keep his car for general use, and who wishes to have the maximum of pleasure with the minimum of worry and expense, the well-made 2-cylinder petrol car takes a lot of beating. Of course, for the man to whom money is no object, the 4-cylinder, high-powered car is essential, but the number of such persons must always be small compared with the thousands to whom the lower-priced, simple, reliable, and efficient 2-cylinder appeals.

Yours, &c.,

Glasgow, March 12th. L. J. A.

THE GLASGOW SHOW.

FOUR years ago I had the privilege of describing in these columns the last motor car-show held in Glasgow, and then ventured to suggest that as the accommodation in Burnbank Drill Hill was much too limited, the promoters would do well to take the East End Exhibition Buildings for the next display. But the organisers of that event went out of business, and it was not until Mr. Walter Cawood came along and beheld the value of the West of Scotland Market that the suggestion came to be carried into effect. Unfortunately the building, although of ample dimensions, is a little out of the way, besides having some structural defects, but neither shortcoming will keep the crowd away, and although it is a little too early at the time of writing (Monday) to prophesy with any degree of assurance, the indications are all in favour of good business being transacted.

The show of cars is wonderfully good and representative, the display of foreign cars especially being remarkable for a provincial exhibition. The arrangement of the stands is rather defective, no attempt having apparently been made to keep the various exhibits of a kind together when space was being let. The result is that some of the best stands are in the hands of metal polish, typewriter firms, and such like. This defect will no doubt be remedied when another show comes along.

About a hundred pleasure cars are on view, of which over fifty are all British, over forty all foreign, and about half a dozen British frames and running gear with foreign engines, or *vice versa*. The Argyll comes first among the British cars in point of numbers, but there are more Darracqs shown than any other make. Most of the Argylls are on the stand of the manufacturers, the others on that of their Glasgow agents, the Western Motor Company, while the Kennedy Motor Company—the Scottish agents for Darracqs—show eleven cars of that make out of the sixteen in the Show. There are eight Arrol-Johnston cars of various types on view, including one of their original dog-carts and the Tourist Trophy winner. Siddeleys come next in number, six cars being on view between the Wolseley Company's stand and that of Rennie and Prosser. Three Wolseley cars are also shown on the Birmingham makers' own stand. A new car to Scotland is the Bell, made by a Yorkshire firm of that name, who show four cars, a number equalled by the Albion cars on the stand of the manufacturing firm of that name. The last-named have also working models of their patent magneto and governor on view. The Rossleigh Company show three Daimlers, two Peugeots, a Darracq, and a Humber. Besides the Siddeley mentioned, Rennie and Prosser show two Panhards of 15-20-h.p., a 35-h.p. Mercedes, and a 40-h.p. Napier chassis.

The Peacock Autocar Company have a couple of 15-20-h.p. Chenard and Walcker machines on view, and another of the make is shown by a Paisley carriage-building firm, McGeoch and Co., fitted with a body of their own make. Another Company of this kind, John Croall and Sons, of Edinburgh, show a couple of De Dietrich cars and a Mercedes, one of the first, and the latter having bodies of aluminium of the firm's own construction. Two of the most handsome cars in the Show are a couple of Delaunay-Bellevilles on the stand of the Western Motor Company, of Glasgow.

Other British, or partly British, cars not already mentioned, are two Humbers, two Kelvins, two St. Vincents, a Crossley, a Holloway, and a Ridley. Other foreign cars are a couple of Clements, and an equal number of Asters (chassis), Spykers, Minervas, Vinots, a Martini, and a Germain.

I noticed eight tricars of seven different makes, one, the Holloway, being of local make. Over twenty motor cycles are shown, the majority being foreign made.

Heavy lurries and road waggons are shown by Morton, of Wishaw, Stewart, and the Glasgow Motor Lorry Company of Glasgow, the Yorkshire Company of Leeds, Coulthard of Preston, and Robertson of Fleetwood. Ten of these machines are on view, all fitted with steam engines. Light industrial vehicles are still few in number, about half-a-dozen all told covering the lot, and three of them are Argylls, two delivery vans, and a commercial traveller's sample carrier, fitted with shelves and seated for two inside. There is probably a better display of boats than usually seen in provincial shows, nine being on view, ranging from a 12-ft. 2-h.p. dinghy to a 30-ft. 12-h.p. cruiser, having a comfortable-looking little cabin forward. This boat, with a 12-h.p. 2-cylinder Brooke motor, is finely built and appears cheap at £275, the price asked. Besides the boats, there are about a score of boat motors, both two and four-cycle, besides propellers, reversing and other gear. Tyre companies present include: Shrewsbury and Challiner, the Samson Non-Skid firm, and Pullmans, of Godalming.

The exhibition was opened on the forenoon of Friday, the 9th inst., by the Marquis of Graham in the presence of a distinguished company. The band of the 1st Life Guards give performances twice each day, a big attraction to many who are not motorists.

A. F. S.

The "Motor School" Case.

THE trial of Riska Medawar and John Raymond Kerr was concluded at the Central Criminal Court on Monday last, and resulted in the acquittal of both the accused.

Mr. Emmanuel Victor, an architect, in giving evidence on behalf of the accused, stated that he was a practical motorist, and in his opinion the premises occupied by the prisoners as a garage were reasonably fitted up for the purpose of teaching pupils to drive motor cars. As in any other business, the art of driving a car depended very much upon the intelligence of the person who drove. He had no doubt that if a pupil possessed the necessary intelligence, and a determination to learn to drive, he might have done well at this garage.

Witness said a friend and himself purchased a car, and started off on their own account. If anything went wrong they had to find out what it was, and put it right.

Mr. Leycester: And you survived?

Witness: Oh, yes.

Medawar went into the witness-box, and swore as to the genuineness of the undertaking, and at the conclusion of his evidence the Common Serjeant held that there was no case to go to the jury.

Both the accused were accordingly acquitted and discharged.

AERONAUTICS.

To the Pole by Balloon.

THE Wellman Polar navigable balloon is approaching completion, and we are now able to supply some further particulars in regard to its appearance and arrangement. The general outline of the balloon is rather like Santos Dumont's No. 9, that is to say, the gas-vessel is a great deal larger towards the front than the rear; and it cubes no less than 6,300 metres. The method of suspension of the hull or car from a flap of the material which constitutes the gas-vessel, is also similar to the Santos Dumont construction, but the hull itself is relatively shorter than most of M. Santos Dumont's navigable balloons, in this respect more resembling the Lebaudy design, and carries a propeller at either end. The manner in which the rudder is mounted at the end of a vertical plane, and the existence of a flat stability plane close under the gas-vessel, also remind one of the Lebaudy airship. In fact, the machine may be roughly described as constituting a cross between Santos Dumont's No. 9 and the earlier type of Lebaudy. The gas-vessel is also constructed on somewhat similar principles to those of the Lebaudy airship, and consists of two layers of pure Para rubber with two layers of cotton interspersed between them. It is intended to make special use of the guide-rope, and in addition to the oil, petrol, and other stores that will be required, the vessel is to carry a small light sheet-steel boat.

Amongst those who it is now announced will take part in the expedition, are the French aeronaut, M. Gustave Hervieu, who has had great experience in ballooning. We have already given particulars of the arrangement of the motors, in accordance with which a 50-h.p. main motor will provide the principal driving power, being assisted when necessary by an auxiliary motor of 25-h.p., which, however, is alone capable of driving the airship.

Three weeks will be spent at Spitzbergen in preliminary experiments, and if they all turn out successful a start will be made at once. There seems no doubt that the explorer really intends making a start, and we trust that his experiences will be more fortunate than those of the Swedish explorer, Andrée, who attempted to solve the problem with a spherical balloon.

Shanks' Flying-Machine.

AMONGST those who claim to have "solved" the problem of aerial navigation, must apparently be included one Mr. James Shanks, of Clapham Park, formerly a boot-maker, and now an auxiliary postman. We understand that his proposed machine is of the flapping wing type, though it does not appear that Mr. Shanks has ever actually constructed one. In order to raise the money to rise in the air, he has brought out a sort of flying machine merry-go-round, which it is stated gives great pleasure to those who entrust themselves to its vagaries. At any rate, there is no propulsion by gas engine, but each passenger appears to supply his own motive power by working treadles. It is stated that Mr. Shanks has employed his leisure moments for forty years in studying aeronautics, but it is difficult to estimate to what the leisure moments of an auxiliary postman, even if extended over a period of forty years, would altogether amount to, and certainly aeronautics does not strike one as providing problems which can be successfully tackled by anybody merely in his leisure moments.

The Emperor William and Navigable Balloons.

EMPEROR WILLIAM has evidently been profoundly impressed by the performances of the Lebaudy airship, and by the fact that it has been bought up by the French Government for military purposes. It is stated that he intends to nominate an Imperial Commission to study the subject scientifically, as His Majesty is firmly convinced that airships of this type are capable of rendering the most valuable services in case of war.

A New Gillespie Model.

FROM the United States come rumours of a new Gillespie model airship, which, from all we can understand about it, consists of a hollow pyramidal structure of the thinnest aluminium plate, externally stayed, which forms the gas-vessel. It is fitted with propellers on either side, driven by a spring motor, and experiments with it are, as usual, said to have been satisfactory. The inventor seems to have some sort of idea of combining the advantages of an airship with an aeroplane, as the pyramidal aluminium gas-vessel is fitted with side aeroplanes. But somehow one does not expect much success from any attempts to combine totally different methods of solving the same problem.

The Gordon-Bennett (Aeronautical) Cup.

THE Aero Club of the U.K. have provisionally selected Professor Huntington, of King's College, Mr. Frank Butler, and the Hon. C. S. Rolls, to compete as the representatives of Great Britain in the "race" for the Gordon-Bennett (Aeronautical) Cup. The other competing countries have selected their teams as follows:—

Germany.—Baron von Hewald and Herr "Hugo."

Belgium.—M. Van der Driesche.

Spain.—Senor J. F. Duro, Captain Kindelau, and Don Esteban Gutteriez de Salamanca.

America.—Mr. Frank S. Lahn and M. Santos-Dumont.

Italy.—Signor Alfredo Vonwiller.

The race, as announced in THE AUTOMOTOR JOURNAL last week, has been fixed to start from the Tuileries Gardens, Paris, on September 30th.

French Military Aeronauts.

THE French Army is carrying out and further extending the training of an aeronautical department, which is more and more becoming a regular and important arm of the service. Candidates for this branch must above all things have keen vision, but what may not be quite as satisfactory to them, they should also be as light and airy as possible, so that no Daniel Lamberts need apply.

* * * *

The Sultan of Johore's 120-h.p. Mercedes.

FOLLOWING his previous purchases of Mercedes cars, we now learn that the Sultan of Johore has acquired from Messrs. J. E. Hutton one of the latest 120-h.p. racers that have been built for this season. The general appearance of this vehicle was shown in our issue of February 17th, where on page 213 we illustrated "Three Generations" of this celebrated make of racer.

THE TARGA FLORIO RACE IN SICILY.—A scene on the Sicilian Circuit on the approach to Isnello, showing a native stage coach drawn by mules.

CLUBS AND ASSOCIATIONS.

Automobile Club of Great Britain and Ireland.

THE Annual General Meeting of the club was held on Thursday, last week, at 119, Piccadilly. Amongst those present were the Hon. Arthur Stanley, M.P., Chairman of the club, who presided, Lord Montagu of Beaulieu, Sir Boverton Redwood, D.Sc., Mr. Robert Todd, Mr. Roger W. Wallace, K.C. A highly satisfactory report and balance sheet for the past year were presented to the members, showing that the club is still continuing its successful career both as a society of encouragement and as a social organisation. In the course of his remarks on the report the chairman referred to the growing membership of the club, which now numbers over 2,800 members, and to the large amount of useful work achieved in many directions during the year, more particularly as regards the institution of examinations for driving and mechanical proficiency certificates, the collection of evidence for the Royal Commission on Motor Car Traffic, touring at home and abroad, and the institution of the International Tourist Trophy Race for the evolution of the best type of motor vehicle. He congratulated the club on its work in connection with the prevention of inconsiderate driving, complaints in regard to which had greatly diminished. He also referred to the growing popularity of motor traction, as evidenced by the increasing number of public motor vehicles in London and the provinces.

The committee for the ensuing year is constituted as follows:—Members elected by ballot on Thursday:—Hon. Arthur Stanley, M.P., Lord Montagu of Beaulieu, Mr. Lionel de Rothschild, Mr. Charles Hardy, Major F. Lindsay Lloyd, R E., Mr. Wilson Noble, Mr. E. H. Cozens-Hardy, Lieut.-Col. R. E. B. Crompton, C.B., Mr. Stanley Spooner, Mr. Alfred F. Bird, Mr. E. Manville, Mr. J. R. Nisbet, Dr. H. S. Hele-Shaw, F.R.S., Mr. M. O'Gorman, Dr. Bruce Porter, Captain Dyke Acland, Mr. T. G. Chambers, Mr. T. H. D. Berridge, M.P., Mr. J. D. Siddeley, Mr. James F. Ochs, Mr. Claude Watney, Mr. E. M. C. Instone, Mr. Alfred Armitage, Mr. Henry Sturmey, Dr. J. Hopkins Walters.

Non-retiring Members this year.—Mr. F. P. Armstrong, Mr. W. Worby Beaumont, Hon. Stuart Bouverie, Professor C. V. Boys, F.R.S., Sir W. J. Bull, M.P., Mr. F. H Butler, Capt. H. H. P. Deasy, Mr. Henry Edmunds, Mr. J. M. Gorham, Col. H. C. L. Holden, R.A., F.R.S., Mr. J. A. Holder, Mr. Vere Ker-Seymer, Mr. W. J. Leonard, Mr. G. Montagu, Mr. Henry Norman, M.P., Mr. Robert E. Phillips, Sir Boverton Redwood, D.Sc., Hon. C. S. Rolls, Mr. C. D. Rose, M.P., Earl Russell, Mr. J. Lyons Sampson, Capt. G. H. J. Skeffington-Smyth, D.S.O., Mr. Sidney Straker, Mr. F. Strickland, Mr. Robert Todd.

Aero Club.

THE second monthly dinner of the Aero Club was held on March 6th at the Florence Restaurant. The dinner was well attended, amongst those present being Mr. R. W. Wallace, K.C. (chairman of the club), Mr. Frank Butler, the Hon. C. S. Rolls, Professor Huntington, of King's College. Mr. and Mrs. Griffiths Brewer (the first lady to cross the Channel in a balloon), Mr. J. Moore-Brabazon, Mr. Martin Dale, Mr. Ernest Bucknall, and Mr. Warwick J. Wright.

H.S.H. Prince Blucher, His Grace the Duke of Sutherland, and the Hon. Arthur Stanley have been elected to the Council of the Aero Club of the United Kingdom.

British Empire Motor Trades Alliance, Limited.

THE following firms have recently been elected to membership:—Messrs. Grice and Harrison; Howes and Burley, Ltd.; Rubery, Owen, and Co.; Joseph Sankey and Sons, Ltd.: Scott, Stirling, and Co., Ltd.; Scottish Motor Eng. Co., Ltd.; William Stephens and Co.; S. Stevenson and Co.; C. A. Vandervell and Co.

Hertfordshire County A.C.

A BIG gathering of members and their friends attended the reception given by this club at Watford on the 8th instant, the occasion being to celebrate the amalgamation which we recently announced. Mr. Basil Crump during the evening gave a lecture, selecting as his subject "Motoring at Home and Abroad," which proved to be a graphic and interesting account of motoring in England, Holland, Germany, Switzerland, Ireland, and India, a series of lantern slides accompanying the lecture. A pleasant little interlude was the presentation to Mr. T. Williams, the hon. secretary of the West Herts Motor Club, which is now merged in the Herts County Club, with a silver cigarette case, as a mark of appreciation of his services for the past season.

Amongst the fixtures already arranged for the coming season, the principal ones are announced to be an Open Motor Cycle Hill Climb at Maple Hill on April 21st, and an Open Car Hill Climb at Aston Hill on June 30th. The opening run takes place on April 7th, at Hatfield.

Nottinghamshire A.C.

On Friday of last week, Mr. Arthur Hirst read a Paper on "The History of the Simms-Bosch Magneto," before the club, in the course of which he mentioned that Mr. F. R. Simms first devoted his serious attention to the employment of magnetos, for the ignition of petrol engines, in 1896, and that it was in 1897–98 that Mr. Simms and a Mr. Bosch (of Stuttgart), had sufficiently developed their machine to place it upon the market. The paper was well illustrated throughout, and much interesting information was given concerning the construction, manipulation, and merits of this very useful type of ignition mechanism.

The Society of Motor Manufacturers and Traders.

The Annual General Meeting of the Society of Motor Manufacturers and Traders will be held at 3 o'clock on Thursday afternoon, the 22nd inst., at Maxwell House, Arundel Street, Strand. The result of the postal ballot for the election of the Council will be announced. The report, accounts, and balance sheet will be submitted. These will show a satisfactory result of the year's work, and a considerable increase in the reserve fund. The formation and work of the various sections—the commercial vehicle, marine, motor tyre and accessories, and carriage builders—will also be detailed.

A general meeting of the Society of Automobile Mechanic Drivers will be held at 51, Brick Street, W., on Tuesday, March 20th.

"Motor Services in Relation to Tramways."

The above is the title of a paper to be read before the Tramways and Light Railways Association on March 27th, at the Lecture Room, Society of Arts, by Mr. Norman D. Macdonald, Advocate (Member), the Hon. Arthur Stanley, M.P. (President), in the chair, 8 p.m.

"Lubrication."

Mr. J. W. G. Brooker has arranged to read a paper at the Auto Cycle Club upon the above interesting and important subject.

COMMERCIAL POINTS.

Omnibus Non-Stop Run.

One of the new 30–40-h.p. Maudslay 'buses which are being supplied to the Scottish Motor Traction Company, recently accomplished a non-stop engine run between Coventry and Edinburgh. Six passengers were carried, and very heavy weather was experienced during the latter part of the journey, which occupied about 25½ hours, including halts for refreshment.

Dunlop tyres again topped the list numerically at the Manchester Motor Show, 164 Dunlops being fitted to exhibition cars.

Amongst the recent purchasers of Daimler cars are H.I.M. the King of Siam, Lord Radnor, and Lord Harlech.

Mr. James Ward, Managing Director of the Northern Quarries Company, Ltd., has just secured a new 20-h.p. Rolls-Royce car, which he intends to use for the purpose of touring the whole country in connection with the new system of road-making, introduced by his Company, which is said to be perfectly dustless.

The formal opening of Messrs. Frank Little and Co.'s new motor depôt and showrooms at 19–21, Westgate Road, Newcastle-on-Tyne, took place last week, when the Mayor of Newcastle, Alderman J. Baxter Ellis, honoured the firm by his presence and support, and referred to the enterprise of Mr. Little and the good he was doing for the city by establishing such a fine garage and important place of business.

At the next general meeting of the Continental Caoutchouc and Guttapercha Company, we are informed, a dividend of 40 per cent. will be declared, as against 33⅓ per cent. in 1905. The turnover during the past year has been far in excess of all previous records, and the turnover for January and February this year also shows a great increase over that of the same period in 1905. Prospects are again very satisfactory, especially with regard to the English business, the turnover of which during the first two months of this year being treble that of the first two months of 1905.

THE TARGA FLORIO RACE IN SICILY.—Some of the natives who are interested in the advent of the motor car (seen on the left) in their midst. The scene is in Caltavuturo.

PNEUMATIC TYRES FOR MOTOR VEHICLES.

THEIR SELECTION, MANAGEMENT, REPAIR, AND MANUFACTURE.

By COLIN R. CROMBIE.—(*Continued from page* 297).

How to carry "Spares."

EVERY driver carries one or more spare tubes. This precaution is necessary, as without spare tubes one is compelled to repair any damage on the road in all weathers, or drive his car home on a deflated tyre, which is an expensive habit, as it usually ruins the tyres. With a spare tube, such risks are avoided, but care must be taken how they are carried, as they are easily damaged. Many drivers keep their spare tubes in the tool box, which is the worst place in which they can be kept, as the moving tools, when the car is in motion, rub holes in them. All spare tubes should be carried in a waterproof bag made for the purpose, as this keeps them from being chafed, and from contact with oil and grease. Spare outer covers should also be carried in special waterproof cases which are made for the purpose. This protects them from the sun's rays and from wet. Care should be taken to attach them firmly to the car, so that they do not get chafed by moving about.

Merits and Demerits of Solid Rubber Tyres.

There is, and I suppose will continue to be for a long time, especially among the recent additions to the ranks of motorists, a good demand for solid tyres. Apart from the unpleasantness of repairing punctures on the road, the matter of expense has often to be considered and the cost of tyre renewals seriously weighed against the advantages of the pneumatic tyre. I think you will find, in the long run, that the pneumatic tyre is the cheapest. The solid tyre may outlast four pneumatics; but, again, the solid tyre will probably wear out four engines, while the pneumatic is keeping one in good condition. Sooner or later the vibration set up with the solid tyre will have its effect in crystallising the metal in the parts chiefly affected by the vibration. I think it will be found more satisfactory to incur the expense of renewing a worn-out tyre than to run the risk of repeated machinery repairs and renewals. The only way to reduce the tendency to crystallisation is to make the parts enormously strong, and I think that in the designing of cars there is an increasing tendency to keep down weight as much as possible.

Chiefly a Matter of Speed.

In comparing the relative merits of the pneumatic and solid tyres as above, I have been referring chiefly to cars which are run at a high speed. As a matter of course, where high speed is not required, and vibration is consequently very much reduced, solid tyres are more suitable and may serve the required purpose, while they certainly save a very substantial amount of expense and trouble.

Fair Wear and Tear of Pneumatics.

Just a few remarks with regard to the ordinary wear of the rubber treads. Everything, even the hardest diamond, wears out, and the time comes when the article becomes unfit for further use and has to be replaced. Sooner or later the rubber tread becomes worn through—sooner on the high power cars than on the small ones—and the canvas, which is the real support of the tyre is laid bare. This must be so, owing to the constant friction of the tyre, against the ground. One would suppose this was evident to most people, but there are some who attribute it to the bad quality of the tyre. All the standard makes of tyres do not contain the same "mixing," but that mixing which each manufacturer thinks is the best, and it is one of the principal points in the manufacture of a tyre to find a mixing for the treads that will stand constant friction without cutting or splitting.

A Stitch in Time.

No one should go on using a tyre after having worn the tread down to the canvas, but it should be sent at once for retreading. In many cases, if a tyre is taken in time and is sound at the bead, it will perform practically the same work as a new tyre. I have seen retreaded tyres run 5,000 miles and more, and I have also seen new tyres worn out in less than 500 miles, under similar circumstances. All makes of tyres are, of course, not equally good.

Roadside Cuts and Punctures.

On all country roads are found the enemies of the pneumatic tyre, such as nails, broken glass, sharp stones, &c., which cut through the treads. The damage caused by these may be of two different natures; only the outer cover may be torn or cut to a greater or less depth, or both cover and inner tube may be cut right through, the tyre being rendered, for the time, useless.

Repairing Minor Damages.

Assuming that only a small nail, or other pointed object, has cut into the tyre, not deep enough to damage the inner tube, the driver can go on for the moment without troubling about repairing it. On reaching home, however, he should clean out the wound thoroughly with petrol and a pointed piece of wood, removing all sand and other grit. He should then apply a good coating of rubber solution, forcing it into the wound with a stick, allowing it to dry until "tacky"—that is, until it clings to the fingers when touched. When the solution is sufficiently dried, the hole should be thoroughly plugged with "Grippa" tyre amalgam sold for the purpose, and this should be thoroughly bound down till quite dry. Only the very best quality of solution should be used for this purpose.

More Serious Cuts and Bursts.

It is, of course, quite a different matter when one or more of the canvas layers is cut. In that case, water, sand and grit are forced into the hole and between the plies of canvas and rubber, blistering the latter and gradually enlarging the hole until the tyre bursts. Such covers can only be repaired in a proper factory. In the case of deep cuts and bursts, the tyre has to be built up again at the damaged part by a special process known as "Stepping."

"Stepping."

This consists in removing a portion of each of the three or four layers of canvas of which the casing is composed, commencing with the inside lining of the cover and reducing the size of the portion removed from each succeeding layer, the smallest portion being taken from the outer layer. The portions removed are then replaced with fresh canvas. This is the only really effective way of repairing such a damage, and I may say that, since this process was introduced by my firm, large numbers of tyres which were considered useless have been made quite sound again, and will out-last the remainder of the tyre.

Useless Patching.

I have seen a large number of similar damages repaired by means of an ordinary two-ply patch stuck over the hole. This is worse than useless, as such a patch has insufficient strength to resist the air pressure, and is forced outwards into the hole, where it is gradually bitten through.

Temporary Repairs on the Road.

When both the other cover and the inner tube have been pierced, the best way to proceed in making a temporary roadside repair is as follows:—The first thing to be done is to detach the outer cover, remove the inner tube, and locate the puncture in the usual way. After having found the hole, take a piece of glass paper, or better still, a small rasp (what is known as a shoemaker's rasp is the very best thing to carry for this work), lay the tube over a block of wood or other suitable surface, and rasp the rubber round the damage until it is quite rough. This gives the solution something to hold to. Unless the surfaces, both of the patch and the tube, are thoroughly roughened, the patch can never be made to adhere properly. Cover well and evenly the patch and the rough portion of the tube round the puncture with two or three coats of solution, and allow each coat to dry until "tacky." This is very necessary, as if the solution is not quite dry the patch will not adhere properly, and will curl up at the edges. Then lay the patch evenly on the puncture, seeing that it does not crease, and press it down firmly. Rub some French chalk over it, so as to prevent any surplus solution from sticking to the cover. If it is only a thin nail that has punctured the cover, it will be sufficient to place a small piece of solutioned canvas over the hole on the inside of the cover. To do this, clean away all the French chalk that is sticking to the cover with petrol, solution both the patch and cover, allowing them to dry before sticking the patch down.

"Plasters" for Large Holes.

Should, however, the damage be a large one, then a different repair will be necessary, and what is known as a "plaster" should be used. A plaster is made up of three or four plies of canvas, each ply smaller than the one beneath it, thus giving a stepping, the various plies of canvas being vulcanised together. This forms a stiff patch, and effectually prevents the tube from being blown through the hole in the cover.

"Plasters" only Temporary, However.

A plaster can, however, only be considered a temporary repair, and the cover should, as soon as possible, be sent to the factory to be permanently repaired. The plaster above described is, of course, cemented to the inside of the cover in the same way as an ordinary patch. If the hole be a large one on the outside, then it will be necessary to put on a gaiter, as otherwise sand and water will get into the interior of the tyre, and thus make the permanent repair more costly.

The Legitimate Functions of a Tyre.

I am disposed to think that the functions which a tyre is required to perform are becoming too numerous. If the tyre-maker heaps on his tyres duties which they were not originally intended to perform, he will be in danger of forgetting what are the principal functions of a tyre. The result will be that, though the tyres may be proof against side-slip, puncture, &c., they will lack resilience, or have a very short life. Nothing is perfect in this world, and the pneumatic tyre has its limits of use. As at present constructed, it is an admirable absorbent of vibration, and can stand a vast amount of wear, but there is no reason why it should be forced to assume properties which are really foreign to it.

Skidding.

Take, for instance, the question of skidding, especially noticeable at this time of the year. Some tyres are more liable to skid than others. To alter the tyre with a view to reducing skidding, as far as possible, has been shown by experiment to tend towards seriously reducing both its resiliency and its wearing qualities. The liability to side-slip is, I think, in many cases, due to the design of the car, or the bad adjustment of brakes, and to make the tyre suffer for this is a mistake. How is it that some cars are more liable to side-slip than others? There is considerable divergence of opinion as to whether round treads or square treads have the least inclination to side-slip. Some say the round tread is the best, because it forces the mud away on both sides, and so gets a grip of the solid road, whereas the square tread traps the mud underneath it. In the same way, of course, the round tread will have a tendency to displace nails, stones, &c. Apart from the application of metal studs, chains, &c., as a preventative of side-slipping, I am inclined to think that the best results would be obtained from round treads having on their face one or more grooves of sufficient depth.

Non-Skid Devices.

The question of non-skids demands close attention until a satisfactory non-slipper and protector has been found. A considerable advance in this direction has recently been made, but I think you will admit that such appliances are still far from satisfactory, and it is hard to tell in which direction ultimate success will be attained. As a protector to the treads, the non-skidding bands now in use are far from being perfect. In my opinion, the great objection to these is that they separate from the tread when running, and thus set up a friction with the rubber of the tread. You may have noticed that when a non-skid of this description has been fitted to a tyre for a few weeks, swelling begins to appear at the sides of the cover. This is caused by the friction on the sides on the tread grinding the rubber into a fine dust. This dust must find an outlet, which it does along the sides of the tyre. The studs keep pounding away until they cut through the canvas, ultimately causing the tyre to burst. No doubt non-skids of this description are of great use as a preventative of side-slip, and thus often prevent serious damage.

Detrimental to the Tyres.

On the other hand, however, there is not the least doubt that any advantage gained in this direction is to a large extent counteracted by the damage which is undoubtedly done to the tyres by their use. Judging from my experience of the condition in which such tyres are when sent to us for repair, I do not hesitate to say that more damage is done in such tyres by these bands than would be possible had the naked tyres received careful usage over average roads for some time. It therefore seems to me that the most satisfactory form of non-skid is a detachable one, which can be temporarily applied to the tyre when the state of the roads necessitates its use.

Spring Wheels.

I am frequently asked if there is any prospect of the pneumatic tyre being superseded by some form of spring wheel. To such a question it is extremely difficult to give an answer. Up to the present time a vast amount of ingenuity and no little money has been expended in experimental work, and apparently to very little purpose. A tyre formed from steel springs is no doubt absolutely proof against puncture, but, on the other hand, is liable to breakage at any time and obviously difficult to repair.

Can Steel Stand Like Rubber?

Everyone who is acquainted with the nature of steel and the action of a spring knows that the finest temper is not absolutely proof against breakage, and that after the springs have been flexed and returned to their normal position a certain number of times, they are liable to fracture at any moment. That they will ever be produced with a resiliency at all equal to that of a pneumatic tyre is, I think, not to be expected.

Future Prospects of Pneumatics.

Then there are other appliances, such as pneumatic hubs, spring spokes, and so on, which seem scarcely worthy of consideration, as they are not tyres at all, but merely ingenious, and probably very effective, forms of spring. Pneumatic tyres have now reached such a stage of perfection that they can be relied upon to run many thousands of miles. They are yearly being improved, and a few years hence will probably be very much better than they are at the present time.

(*To be concluded.*)

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Conversion of the L.C.C.

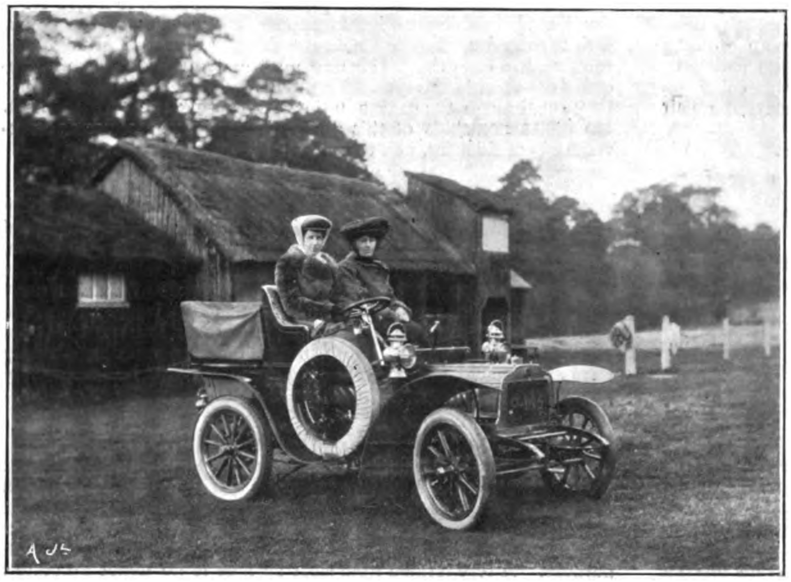
THOUGH the London County Council have hitherto been deaf or blind to the advantages of the motor 'bus, and have devoted all their backing to the electric tram, it is plain that they are not altogether insensible to the advantages of the automobile in a more restricted sphere, as it appears from the information recently issued to the public that the Council are being recommended by their Establishment Committee to purchase *two* motor cars, one for the Engineer's Department and one for the Architect's Department. In the meantime they are to hire cars for the use of committees and of heads of departments. Perhaps really after all the County Council have no inherent objection to automobilism, and mayhap when once all the electric trams at present contemplated have been put down, will become more friendly to the motor 'bus.

Too Late for Prevention.

IN the meantime, the colossal character of their expenditure on tramways has excited much general indignation in various circles, and Mr. N. Woodward, at the General Meeting of the Surveyors' Institute, on Monday last, suggested that Parliament should pass an Act to prevent the enormous outlay on tramways which the London County Council are contemplating. We fear there is not much chance of that Act being passed, as probably most of the contracts are already signed, but if the County Council attempt to add further to the tramification of London, we certainly trust that any such attempts will be opposed in the most determined manner possible.

A Novel Grievance.

THE drivers and conductors of motor 'buses have been congratulating themselves on the much shorter hours which prevail in that profession than are customary in connection with the old-fashioned horse-pulled 'buses. Everything in this world, however, appears to have its compensations or corresponding disadvantages, and the conductors declare that the large number of fares they have to collect, the peculiar motion of the motor 'bus, and their frequent excursions to the top and along the top of their vehicles, has the effect of prodigiously increasing their appetites, so that although their wages are higher than those of horse 'bus conductors, they actually have less money to spend owing to the increased amount which they consume in eatables. Some people are never happy. One is reminded of the farmers who one very favourable year complained that the turnips were growing so big they would soon be unable to boil them.



Many people are surprised at the number of lady automobilists who are now constantly seen driving their own cars both in town and country. There are many chauffeuses, however, who go beyond merely driving their cars; they also take a great pride in looking after them in every respect, making adjustments, and even to cleaning their vehicles. Miss Hotham must be included in this category, being, moreover, a self-taught motorist, never having had a chauffeur. Miss Hotham, who is seen in our photograph at the wheel of her Georges-Richard car, plays golf for Surrey and Woking. Her companion is Miss Lily Mott, who is also known in the world of sport.

The Royal Tour in South Africa.

THERE has been no little discussion at various times as to the suitability of the standard types of pleasure vehicles for use in South Africa, so that it is interesting to find that their Royal Highnesses the Duke and Duchess of Connaught patronised this form of locomotion during their visit to Bloemfontein. A 6-cylinder Napier having been placed at their disposal by Mr. C. Newberry, their Royal Highnesses were enabled to make a much more extended inspection of the surrounding country and places of interest in the short time available than would otherwise have been possible.

More Police Illegality.

THE police are so very fond of issuing several summonses constituting different charges in reference to one and the same occurrence, that it cannot perhaps be too generally known that this procedure is quite illegal and opposed to the principles of English common law. A case of the kind, which is interesting, as the Bench recognised this illegality, was heard before the Petersfield County Bench on the 7th instant. Mr. Charles Hoffer was summoned for not stopping his car when requested to do so, in Dragon Street, Petersfield, for driving negligently in the said Dragon Street, and for driving a motor car at a speed dangerous, &c., also in Dragon Street, the occasion being, of course, one and the same throughout. The first summons was dismissed by the Bench, whereupon counsel for the police proposed to proceed with the other two summonses. Mr. Staplee Firth, who defended Mr. Hoffer, pointed out that this was not permissible, according to the principles of English common law, and that having been let off on the first count, the defendant could not be convicted on either of the other two. The Bench ultimately accepted this view, and dismissed all the summonses.

Scottish Enterprise.

WITHIN the next week or so all the scaffolding will be removed from outside the Argyll Company's new works at Alexandria which, with the extension now in progress, will eventually cover nearly fifteen acres. Even at present over 1,100 hands are employed, we understand, at these works alone, but when everything is in readiness this number will be nearly doubled. It is a striking example of Scottish enterprise that neither of the three leading firms—the Argyll Company, the New Arrol-Johnston Company, and the Albion Company—have been able to keep pace with their orders during the past year, the Arrol-Johnston Company having been especially busy since their victory in the Tourist Trophy Race, and the Albion Company since their performance in the Scottish Trials last May.

"Can England be Invaded?"

MR. WILLIAM LE QUEUX, who has been at work in conjunction with a number of experts, amongst whom, we are given to understand, Lord Roberts may be included, is just bringing out an elaborate treatise on the question as to whether England can or cannot be invaded, entitled "The Invasion of 1910." Mr. Le Queux states that in preparing the facts for his fiction, he had to make a strategic survey of the whole of the east coast of England, and this he did by means of a 40-h.p. Napier car, which in the course of his work carried him some 7,000 miles over all kinds of roads and covering a period of four months without ever compelling him to stop a single minute on account of the engine. This forms a good additional proof of the great importance of the motor car—a point which, by the way, has not been previously much dwelt on—for military survey purposes.

The False Character Question.

IN any industry in which the demand for employees greatly exceeds the supply, improper methods of obtaining situations are likely to be frequent. An alleged instance in point was provided the other day by Ernest Edward Rance, who was stated to have made use of a false character in order to enter the service as chauffeur of Mr. E. C. Javal, Managing Director of Messrs. Spiers and Pond. Not long previously Rance had, it was stated, been successful in smashing up a valuable motor, the property of his previous employer, was was consequently not exactly bubbling over with anxiety to recommend him to a new situation. Rance, however, produced a written character in which there was nothing about the smashed-up car. The charge was that the said character had been fabricated. Mr. Javal, who did not desire to press the case, said he only took proceedings on account of the very great danger to the public occasioned by this sort of thing, as Rance's character was not only misleading, but he was completely ignorant of motor car driving. Mr. Horace Smith, the magistrate before whom the case was brought, thought that there was more than met the eye in it, and he remanded Rance while the police instituted enquiries.

A "Haul."

AN illustration of the way in which our local journalists in some places, at any rate, still regard the situation, is provided by the title which a local quill-driver uses in referring to the recent proceedings before the Kingston Bench, at which seven motorists were fined, several of them as much as £10 on the usual charge, as "another haul of motorists." Amongst the victims were Earl Russell, who, as three previous convictions had been recorded against him, topped the list with a payment of £15.

Poor South Pole!

IT is almost time, one would think, that a society should be inaugurated for the protection of the South Pole from ill-considered onslaughts, for hardly a week, certainly not a month, passes without someone proposing another method of reaching that inaccessible and doubtless highly inhospitable spot. Dr. F. A. Cooke, of New York, is the latest aspirant for Antarctic fame, and he is said to be having three motor cars built for the purpose of making "a dash on the Pole." The cars, which are to be 12-h.p. machines, and are understood to be a wonderful combination of wheels and runners, are fitted, we are told, "like caravans," which probably merely means that they will be closed, and will carry provisions—an obvious necessity. Dr. Cooke intends to proceed by ordinary methods to a spot some 750 miles from the Pole, and then he will let loose his motor cars. We wonder whether any of the numerous paper Antarctic explorers will ever be prevailed upon to make an actual start.

Further Threatened Patent Litigation in America.

JUST in the same way that the early "Renault direct-drive" patent (No. 3981 of 1899), and also Daimler's "Mercedes gate" patent (No. 9805 of 1899), have been raked up over here recently, so in the United States there is some talk of attempting to enforce the payment of royalties on certain American patents that were taken out some years ago, but had been more or less forgotten in the meantime. Thus, for instance, Dyer's patents, numbered 657,650 and 662,401, filed on June 8th, 1898, and April 26th, 1899, respectively, are alleged to give a monopoly in the use of the "gate" system of arranging the change-speed-lever on cars, and the use of sliding spur-wheels in the gear-box. In connection with petrol engines operating on the 2-stroke cycle, moreover, Sintz's patent, No. 509,255, applied for on October 27th, 1892, and Cock's U.S.A. patent, No. 544,210, applied for on March 10th, 1894, are likely, it is said, to be heard of in the Law Courts shortly. Further than this, we learn that the Hartford Suspension Company are taking action to uphold their shock-damper patents, this Company owning Nos. 695,508 (Truffalt), 12,399 (re-issue), and 803,590 (Hartford). The Selden "master patent" bogey in America still, of course, holds very strong sway.

The "Automotor Journal" at the Agricultural Hall, March 24-31.

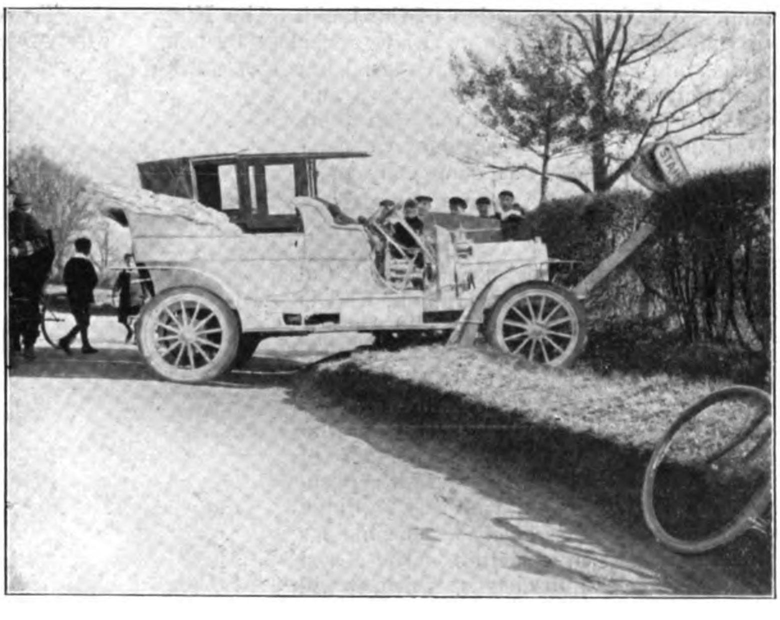
THE number of the Stand of THE AUTOMOTOR JOURNAL during Messrs. Cordingley's Motor Show at the Agricultural Hall will be 161, in the Large Hall, almost immediately facing the entrance to the Minor Hall.

Nice Carnival in London.

A VERY ambitious scheme is in course of organisation for carrying out a big Carnival at the Crystal Palace on the first two days of June, in aid of the Royal Waterloo Hospital for Children and Women. An extensive round of amusements has been specially arranged under the energetic organisation of Mr. E. Douglas White, and doubtless the motor car will play a prominent part in this "Nice" festival in London, in like manner to its employment at the French festivities. The Carnival should be a source of enormous attraction, especially in view of the good cause in which the effort is to be made.

Motoring Annual, 1906.

A NEW edition of this useful volume is now published, and is again conspicuous for the variety and wide range of the information contained. Thus, there is the extensive motorists' "Who's Who," the list of clubs and associations with their members and a *resumé* of the principal motoring events of the past year. Several pages of useful data, both mathematical and practical, forms another portion of the work, which includes a general directory of manufacturers and agents.



Last week a curious accident occurred at Fulwell, when two cars, owned by Colonel Fowle, of the 21st Lancers, and Mr. H. O. Mack, of South Kensington, respectively, came near having a very serious experience. The result is seen in our photograph above. They were proceeding towards Hampton Court and Staines, respectively, when they simultaneously reached the point where the main roads cross. In trying to avoid a collision, the two cars swerved round and dashed into the ditch, side by side, knocking down the signpost, which is seen lying in the hedge. Both cars were considerably damaged, but fortunately both the drivers, who were the only occupants of the cars, escaped without injury. Colonel Fowle's car is the white car in front—a 15-20-h.p. Brooke.

A 15-20-h.p. Brooke "Estate" Car.—This vehicle is one of the latest productions of the Brooke factory and has been specially designed for all round use at country houses. As illustrated it is convenient for station work, the front portion affording a comfortable and well-protected carriage for passengers, while the luggage is placed behind. By removing the top, the car can be converted into a shooting brake. Lord Linlithgow and Col. Charlesworth have already acquired similar vehicles.

A VERY sad motor car accident, of which the Marchesa Corsini di Lajatico, wife of the Equerry to the King of Italy, and herself a member of the great Barberini family, was the victim, occurred in Italy last week. The Marchese Corsini di Lajatico was himself driving his wife back to Rome, across the Campagna, when the car skidded and collided with a bridge wall. The Marchesa was thrown out into a ditch, and died immediately from concussion of the brain. The King of Italy was at once informed of the accident by telephone, and His Majesty, with his usual impulsive warm-heartedness, sent on his surgeons, and followed with Queen Helena. On their Majesties' arrival at the scene of the accident, the Marchese was completely prostrated.

Enfield Motor Cars.

WE omitted to mention last week the important part which Mr. Guillon, who is the works manager of the Enfield Autocar Company, will take in the work of introducing, on an extensive scale, the vehicles which the Enfield Company will shortly be placing on the market. Mr. Guillon, who has been a very successful designer of motor cars in France, and afterwards occupied a similar position with the Fabrique Nationale, Liege, is solely responsible for the design and manufacture of the Royal Enfield vehicles and chassis, which, it will be remembered, were on exhibition at Olympia in November last, and have since been seen at the leading shows in the country. Mr. Guillon will continue to occupy his position of designer to the new company combined with the responsibility of works manager. His practical knowledge and experience, together with the managing director, Mr. E. H. Lancaster's, knowledge of the requirements of the English and Colonial markets, should result in considerable benefit both to the clients of the company and the shareholders.

Further Vanguard Tours.

THE London Motor Omnibus Company are reviving the idea of organising a tour to the South of France with one of their 30-h.p. "motor coaches." The tour, it is announced, will occupy 30 days, and visit Avignon, Marseilles, Lyons, Hyères, St. Raphael, Nice, Monte Carlo, and Mentone and other interesting places, returning viâ Paris. It will cost each passenger a fee of £57 15*s.*, including hotel accommodation on the way, and all incidental expenses. Throughout the journey the tourists will be able to travel either outside or inside, as they may prefer, and they will be thus independent of temporary atmospheric unpleasantnesses.

A Suggestion for Enthusiastic Motorists.

THE Winton Motor Carriage Company have sent round an amusing "motto for office use," which takes the form of the following suggestion:—"If motoring interferes with your business, give up your business."

Motor Cars and Horse Shows.

AT the Richmond (Surrey) Royal Horse Show, which is annually held under the direction of the Richmond Horse Show Society, Ltd., this year the dates fixed being June 15–16, a feature is made of the exhibition of motor cars.

Edinburgh's Motor Fire Engine.

THE Scottish capital has just acquired one of the Merryweather "Fire Kings" at a cost of £1,150. It is a standard machine with water-tube boiler and oil burner.

A "TOURIST TROPHY" VAN.—This, the third White steamer in Liberty and Co.'s employment, is of particular interest on account of the fact that the chassis is that actually driven by Mr. Coleman in the Tourist Trophy Race. The mere fact that a Tourist Trophy chassis should be suitable for business purposes is significant, for it will be remembered that at one time there were some people who imagined that this race would only develop useless freaks.

The attractive centre picture of Cordingley and Co.'s Agricultural Hall Motor Show Poster.

The Agricultural Hall Exhibition.

NEARLY 300 individual firms will stage exhibits at Messrs. Cordingley's Motor Car Exhibition, opening next Saturday, March 24th, at the Agricultural Hall. We have already drawn attention to the many important associations, headed by the Motor Union, who will hold their important gatherings during the Show Week at the Hall, rendering the Islington venue the centre of a really important motor week from the 24th to 31st inst. The stand of THE AUTOMOTOR JOURNAL will be No. 161, almost immediately facing the entrance to the minor hall.

Dust Preventatives.

AMONGST the new preparations for rendering roads dustless with which it seems we are likely before long to be inundated, is mentioned a new and wonderful composition entitled "Newstrand." It is of a nice dark brown, you make as good a road surface as you can, and then you pour the "Newstrand" on it, wait till it is dry, and on that stretch of road you will never see dust again. At least that is what is said!

BRITISH EXPORTS AND IMPORTS OF MOTOR CARS, &c., FOR 1906.

NOTE.—In our issue for January 13th, 1906, we published in one table the full figures of British Exports and Imports for 1902, 1903, 1904, and 1905. Prior to 1902, motor cars were not classified separately.

1906.	Imports.					
	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.
		£	£		£	£
January ...	458	175,270	136,720	114	2,889	1,989
February...	530	211,824	184,598	130	3,507	1,511
Total...	988	387,094	321,318	244	6,396	3,500

NEW COMPANIES REGISTERED.

Automixte (Limited).—Capital, £1,000 in £1 shares. Object, to carry on the business of motor car proprietors, &c.

Automobile Transit Trust (Limited).—Capital, £4,400 in 4,000 "A" shares of £1 each and 8,000 "B" shares of 1*s.* each. First directors, J. Simpson and I. B. Blaiberg.

Burke Engineering and Motor Company (Limited), Parnell Street, Clonmel, co. Tipperary.—Capital, £6,500, in £1 shares. Objects, to deal in motor cars, &c. (Irish company.)

Doherty Fittings Company (Limited).—Capital, £10,000 in £1 shares (5,000 "A" and 5,000 "B"). Object, to acquire the business carried on by J. Doherty and M. T. Hawkins at 21, Bishop Street, Birmingham, as Doherty and Hawkins, manufacturers of and dealers in cycle, motor car, and vehicle parts and accessories. First directors, E. H. Timson (chairman), J. Doherty, and M. T. Hawkins.

Enfield Autocar Company (Limited).—Capital, £150,000 in £1 shares. Object, to acquire from the Enfield Cycle Company, Limited, the motor car manufacturing business heretofore carried on by the said company at Enfield Works, Hunt End, Redditch. First directors, E. J. Seymour, G. H. Cartland, T. Evans, R. W. Smith, A. Eadie, and E. H. Lancaster.

Ernest Arnott and Holloway (Limited). — Capital, £5,000 in £1 shares. Object, to carry on the business of manufacturers of and dealers in vehicles of all kinds. First directors, E. Arnott and W. C. Holloway.

Excelsior Works, Coventry (Limited), 18, Hertford Street, Coventry.—Capital, £2,000 in £1 shares. Object, to carry on the business of manufacturers, repairers, and dealers in cycles, motor cycles, &c. First directors, E. H. Godbold, G. H. Green, V. Godbold, H. Evans, T. E. Donnison, C. Martin, and J. T. Fazakarley.

Hahnite (Limited), 16, Philpot Lane, E.C.—Capital, £2,000 in £1 shares. Object, to acquire the rights of R. M. Hahn for the United Kingdom in an invention relating to an improved oleaginous mixture for sprinkling on roads. R. M. Hahn, first managing director.

Motive Power Supply Company (Limited), 245, Union Street, Aberdeen.—Capital, £10,000 in £1 shares. Objects, to develop the sale of the Central Valve Internal Combustion Engine for fishing boats, yachts, barges, &c. (Scotch company.)

Pilot Motor 'Bus Company (Limited).—Capital, £100 in £1 shares.

Scottish Motor Syndicate (Glasgow), (Limited).—Capital, £2,500 in £25 shares. Object, to manufacture or deal in motor cars, cycles, &c. (Scotch Co.).

The Motive Power Supply Company (Limited), 245, Union Street, Aberdeen.—Capital, £10,000 in £1 shares. Object, to develop the sale of the central valve internal combustion engine for fishing boats, &c., patented by William Peck, F.R.A.S., Edinburgh.

Universal Motor (North America) Syndicate (Limited).—Capital, £4,100 in £1 shares (100 founders'). Object, to manufacture and deal in motors for traction, agriculture, trade, and other purposes, including the Motor for all Purposes and the Universal Motor, in the United States of America, Canada, and elsewhere. First directors, C. T. M. Wakefield and H. W. Bliss.

Victoria Carriage and Motor Car Company (Limited), 117, Broad Street, Hanley.—Capital, £2,000 in £1 shares. Object, to acquire the business of a carriage builder, carried on by T. A. Astle as Sargeant and Co. First directors, T. A. Astle and A. T. Poole.

Waltons and Company (Limited).—Capital, £1,000 in £1 shares. Object, to acquire the business of a cycle and motor manufacturer, &c., carried on by H. Walton, at Shorey Works, Dawson Square, Burnley, as Waltons and Company.

Wilson Thom Canal Power Syndicate (Limited).—Capital, £30,000 in £1 shares. Object, to acquire patents relating to the production and application of gas as a motive power for boats, barges, and other vessels.

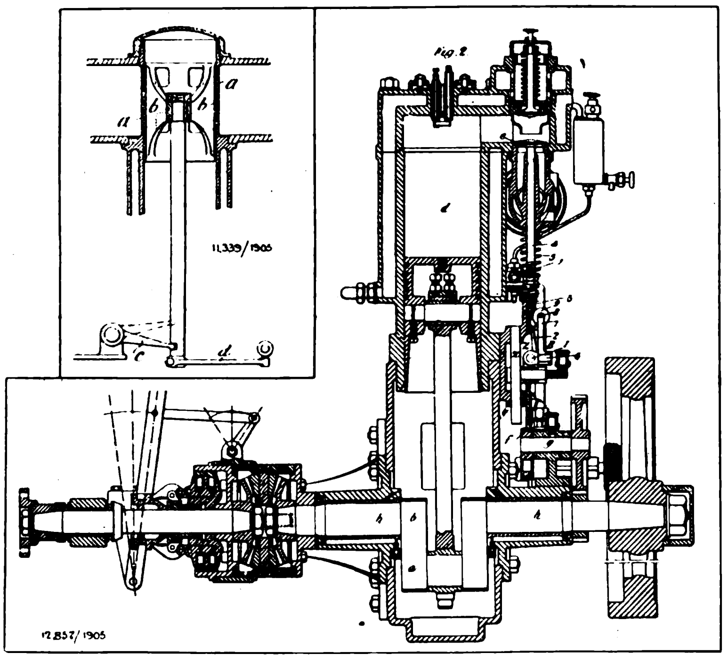
1906.	Exports, British and Irish make.								Foreign and Colonial Re-exportation.					
	No. of Cars and Value.		Parts Value.	*B.S. Africa.	No. of Motor Cycles and Value.		Parts Value.	*B.S. Africa.	No. of Cars and Value.		Parts Value.	No. of Cycles and Value.		Parts Value.
		£	£	£		£	£	£		£	£		£	£
January ...	146	48,759	16,334	6,825	84	2,112	2,211	637	68	26,999	9,582	4	205	355
February ...	72	19,493	19,838	5,642	44	1,298	1,980	288	39	19,688	5,840	2	65	201
Total...	218	68,252	36,172	12,467	128	3,410	4,191	925	107	46,687	15,422	6	270	556

* *Included* in the totals of Cars, Cycles, and Parts.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application ; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

11339. 30th May, 1905. Improvements connected with valves suitable for Regulating the engines of Motor Cars. Sir W. G. Armstrong, Whitworth and Co., Ltd., and Walter G. Wilson, Elswick Works, Newcastle-on-Tyne. It has before been proposed to regulate the supply of gas to the engine by a throttle-valve consisting of two co-axial cylinders having similar ports through them, the two ports exactly registering with each other when the maximum supply is required. In this invention two methods are provided for adjusting the effective size of the port, namely, by moving one cylinder axially relatively to the other and by rotating the same cylinder relatively to the other The advantage of this arrangement is that a much finer adjustment can be obtained than with a single movement, and this is especially the case when the valve is nearly closed. The two movements are given by different agencies, as the longitudinal movement by a treadle and the rotary movement by hand or by the governor. There are seven figures. Fig. 1 is a diagrammatic section of a valve operated according to this invention ; *a* is the valve casing and *b* the cylindrical valve. In this figure the valve is fully open so that the ports in the valve and casing coincide ; *c* is an arm operated by a treadle and engaging with a groove cut partly round the valve spindle ; *d* is an arm fixed to the valve spindle and operated by hand by a wire.—February 21st, 1906.



11,339/1905

12857/1905

12857. 21st June, 1905. Improvements in Marine Paraffin Motors. Daniel Goedkoop and Jan Goedkoop, Kromhout Motor Works, Amsterdam. This invention relates to marine engines driving the screw-propellers of boats, and actuated by the combustion of a mixture of vaporised paraffin and air in proper proportions, the driving-shaft of each motor engine being connected with the screw-propeller in such manner that the latter can be stopped or reversed. There are five figures. Fig. 2 is a vertical longitudinal section. The improved paraffin marine motor is of vertical, single-cylinder, four-stroke-cycle, slow-speed type, the speed being from about 340 revolutions per minute of the smallest size engine to about 250 revolutions per minute of the largest size. The motor is self-contained, and the reversing-gear and thrust-bearing for the propeller may be of any suitable kind, but preferably they are fixed upon the casing, *a*, in which the crank, *b*, revolves, this casing being closed in the usual way, and containing lubricating oil. The inlet-valve of the engine is automatic in its action, being opened by the pressure of the air drawn into the cylinder, *d*, whilst the exhaust-valve, *e*, is operated by an eccentric, *f*, fixed upon a half-time geared shaft, *g*, made to revolve at half the speed of the crank-shaft, *h*. The mode of ignition is electric, the spark being obtained by a low-tension oscillating magneto apparatus of the well-known kind driven from the same shaft, *g*, as the exhaust-valve, *e*, with make and break contact of the kind usually used in low-tension ignition-apparatus, moved from the oscillating lever of the magneto apparatus. The oil or paraffin is forced into the cylinder, *d*, with the air, by means of a small plunger-pump, *j*, driven from the same eccentric, *f*, which operates the exhaust-valve, *e*. This eccentric also actuates a small inertia or pendulum-governor at B, which, when it is brought into action by any increased speed of the engine, operates (on the well-known hit-or-miss system) so as to stop the working of the exhaust-valve, *e*, and at the same time to prevent the paraffin-pump from operating. When the motor is first started and the vaporiser cold, a small quantity of petrol is used instead of paraffin, and when this petrol has been consumed the vaporiser is hot enough to continue the working with paraffin. The speed of the motor can be diminished to a certain extent by reducing the stroke of the fuel-pump and thereby the supply of paraffin. The eccentric, *f*, fixed upon the half-timed eccentric-shaft, *g*, geared with the engine-shaft, *h*, has its rod connected by a pin with a cross-head above, which is accordingly made to move up and down vertically, being guided by means of a strong bar or pin, *x*, fixed to it and working in guides, *y*, carried by the frame of the engine. Upon the upper part of this crosshead is formed a bracket, *z*, in which is pivoted, upon a long pin, 1, at right angles to the crank-shaft below, a boss carrying a strong vertical lifting-arm, 2, the upper end of which has a somewhat angular edge (parallel with the pin 1), which actuates when necessary a corresponding sliding-piece or bar, 3, the lower end of which has a corresponding angular edge, and the upper end of which (when the lifter, 2, is vertical) engages with a bar or block sliding in vertical guides, the upper end of which, when sufficiently raised, strikes the lower end of the exhaust-valve spindle, 4, which raises it against the pressure of a helical-spring, 5, round the valve-spindle. If, however, the lifting-bar, 2, is turned out for a short distance, it escapes the sliding-bar, 3, actuating the exhaust-valve spindle, 4, and the valve (which has been closed by the spring, 5) remains closed. In order to determine the position of the lower knife-edged lifter, 2, as required and as influenced by the speed of the engine, the boss at the lower end of the lifting-bar, 2, which turns upon the pin, 1, in the bracket, *z*, on the crosshead, *w*, has projecting from its front a horizontal-pin, 6, upon which turns the lower end of the vertical-arm, 7, of a bell-crank, the upper end of which is fitted with a horizontal-pin, 8, upon which revolves a light wheel or disc, 9, having an annular groove round its circumference, the axis of the disc being parallel with the pin, 1, in the bracket upon the crosshead, upon which the angular lifting-bar, 2, turns as above described. The grooved disc, 9, is arranged so that if the vertical-arm, 7, of the bell-crank upon which it is pivoted is vertical, the lifting-bar, 2, is also vertical, and actuates the sliding-piece, 3, above, and the exhaust-valve, whils if it is turned slightly out the lifting-bar, 2, does not come in contact with the corresponding sliding-piece, 3, above, and the exhaust-valve remains closed, the wheel running upon an angular fixed rail during the upper part of its stroke. The movement of the lifting-bar, 2, from its vertical position is determined by the governor—a normally horizontal arm of the bell-crank, carrying an adjustable weight, the governor being held in this position by a helical-spring, which is wound round the prolonged pin, 1, in the crosshead, upon which the boss, carrying the lower angular lifting-bar, 2, turns, one end of the spring being bent laterally under the horizontal-arm of the bell-crank, and the other end being held by a socket fitted upon the outer end of the pin, 1, the strength of the spring being adjusted accurately by adjusting and fixing the socket in its position. The tendency of the spring is both to lift this weight and the horizontal-arm of the governor, and also to press the valve lifting-bar against the guide-bracket of the engine. In this position the exhaust-valve, *e*, is lifted at every revolution of the eccentric-shaft, *g*, but if the speed of the motor becomes too high, the inertia or downward pressing force of the weight, when the crosshead moves upward, becomes greater than the lifting force of the spring, and the bell-crank lever turns slightly, its vertical-arm, 7, moving sufficiently (between stops on the lifting-arm) to bring the grooved disc, 9, opposite to a corresponding fixed inclined guide-rail, along which it runs as the crosshead rises and falls, the lifting-arm, 2, being at the same time moved out at a slight angle, so that its upper edge escapes the corresponding edge on the upper sliding-piece, 3, and the valve-spindle, 4, remains inoperative until the motor falls to its normal speed. The sliding-piece, 3, thus left unmoved, also fails to operate the pump by which the paraffin fuel is injected, so that in this position of the governor the pump remains unaffected.—February 21st, 1905.

Patent Specifications Published.

Applied for in 1904.

Published March 22nd, 1906

25,872.	P. C. Lawless. Intl. combn. engines.
26,086.	A. Vogt. Means for obtaining motive power by the action of a jet of steam of other gases.
26,178.	A. Vogt. Apparatus for producing combustion gases under pressure for use as motive power for driving turbines and the like.
28,670.	J. H. Bishop. Starting handle.

Applied for in 1905.

Published March 8th, 1906.

1,107.	Sir F. Ripley, Bart., and C. T. Santler. Non-skidding devices.
2,656. 2,656A.	H. N. Simester. Side carriages for motor cycles.
2,866.	A. T. Fisher. Mechanism for inflating pneumatic tyres.
5,166.	F. Scatchard Connecting-rods for intl. combn. engines.
6,054.	D. J. Jones. Side carriages for motor cycles.
8,151.	A. H. Preen. Variable lift inlet valves
8,722.	W. P. Burke. Intl combn. engines.
9,047.	F. A. Griffin. Control levers.
10,077.	L. Cox. Pneumatic tyres
10,536.	E. L. P. Turenne. Petroleum motors.
10,743.	A. Coats. Steering wheel axles.
11,339.	Sir W. G. Armstrong, Whitworth, and Co., Ltd. Regulating valves.
12,857.	D. and J. Goedkoop. Marine paraffin motors.
13,252.	H. De la Valette. Magneto-electric machines.
13,551.	J. S. G. W. Stroud. Transmission change-speed-gear.
16,057.	J. Gawron. Magneto ignition apparatus.
20,775.	F. C. Miller. Rear axles.
21 665.	A. A Longuemare. Carburettors.
21,744.	R. Gaignard and A. Amelot. Resilient wheels.
22,113.	F. Reichenbach. Ignition devices
22,501.	F. X. Moyer. Armour for tyres.
23,172.	H. Pieper. Electro-mechanical systems for the propulsion of automobiles.
23,898.	H. Kerngood and H. A. Taylor. Tyres.
23,988.	E. Wigglesworth. Flexible wheels.
24,873.	E. Evans. Apparatus for preventing the raising of dust.

Published March 15th, 1906.

934.	A. H. Nicholson. Ignition apparatus.
3,534A.	F. P. Candy. Driving belts for motor cycles.
4,184A.	C. H. Stotesbury and T. P. Reid. Non-slipping and non-puncturable band for tyres.

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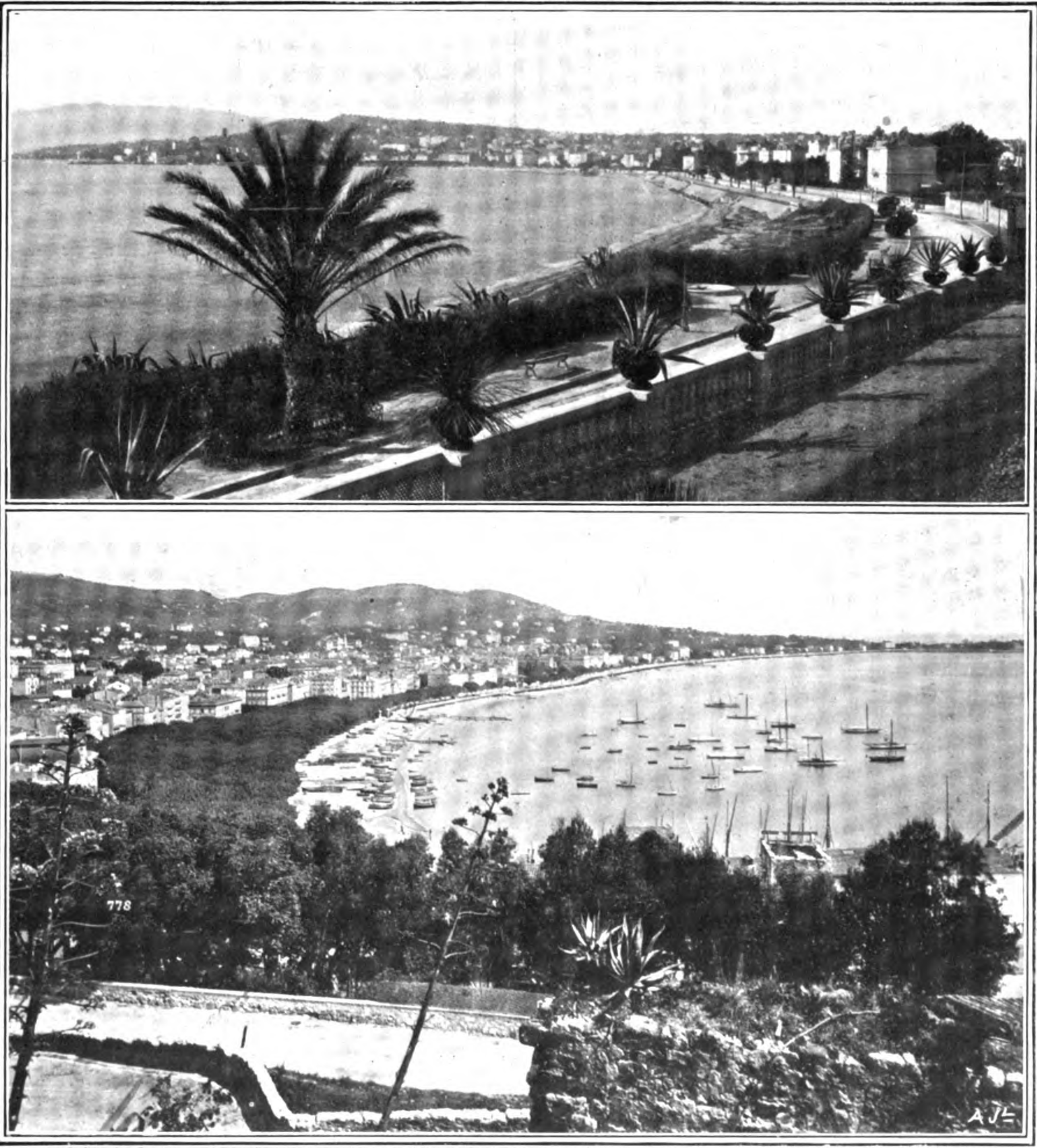

Two views of Cannes on the Riviera, where the opening Motor Meet of 1906 was concluded last week. The top picture is a general view from the Pointe de la Croizette, and the bottom picture is taken from Mont Chevalier.

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DIARY OF FORTHCOMING EVENTS.

British Events.

March ...	*4,000 Miles Tyre Trials.
March ...	*Lamp Trials.
March ...	*Speedometer Trials.
March 24–31	Cordingley and Co.'s Motor Show.
March 28 ...	"Public Service Motor Transport." Paper by W. Worby Beaumont (Automobile and Cycle Engineers' Institute
May 24 ...	Frome's Hill Climb (Herefordshire A.C.).
May 26 ...	Motor Union Meeting (Birmingham).
June 11–16 ...	Land's End to John O'Groat's (Auto Cycle Club).
June 13–16 ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July ...	Motor Yacht Club Reliability Trials.
July 21 ...	Motor Union Meeting (Bath).
Aug. ...	*Van Trials.
Sept. 22 ...	Motor Union Meeting (York).
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.):

March 25–31	Nice week.
April 1–15 ...	Monaco Motor Boat Exhibition and Races.
April 1–17 ...	Budapest Exhibition (A.C. of Hungary).
April 18–26 ...	French Resilient Wheel Trials.
April–May ...	Milan Exhibition.
May 1–15 ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ...	"Targa" Florio (Sicily).
May 12–24 ...	Tour de France (Motor Cycles and Voiturettes).
May 14–31 ...	Milan Reliability Trial.
May 27 ...	Motor Bicycle Championship (Moto Club de France).
June 6–13 ...	Herkomer Cup.
June 17 ...	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 28–29 ...	Kiel Motor Boat Races.
June 29 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
July 26–Aug. 15	Circuit Européen.
Aug. 13 ...	Ardennes Circuit.
Aug. 18 ...	Coupe de Liedekerke (Belgium A.C.).
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15–16 ...	Mont Ventoux Hill-Climb.
Sept. 20 ...	Lake Major Motor Boat Races.
Oct. 5–14 ...	Leipzig Exhibition.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

A Good Year's Work.

The Motor Union is to be very sincerely congratulated on the year of strenuous work which lies behind it, the main features of which are embodied in the Annual Report which has recently been sent out to the members. The number of fields of activity in which the Union has contributed to the advantage of the automobile movement is quite remarkable, but three special departments may be selected out of much useful work as of particular importance and value to the future of the movement. We refer specially to the action of the Union in regard to speed limit applications and enquiries, prosecutions undertaken by the Union against ordinary offenders against the highway laws, and last, and perhaps most important of all, the Motor Union's work in placing evidence before the Royal Commission.

The increased energy displayed by the police soon after the new Act came into operation in 1904, resulted, as many of our readers know to their discomfort, in a large increase in the number of police prosecutions, and that increase was continued throughout last year. The advantage to members of being able to readily obtain legal advice of a reliable character is accordingly increased. Localisation and the formation of the "Legal Cases Committee" of the Union has proved of the greatest use in supplying for all members expert legal advice and information free gratis, and for nothing. In connection with the same line of usefulness, a large number of solicitors have been specially appointed by the Union, in different parts of the country, who can be relied upon by local automobilists as possessing special experience in motor car law.

The large amount of work which the officials of the Motor Union have got through in fighting applications of local bodies for a speed limit of 10 miles per hour, may be judged from the fact that they have had to fight during the past year no less than eight different applications, in the majority of which the Union has been successful in preventing the imposition of this highly arbitrary restriction.

It is in connection, however, with the Royal Commission on Motor Cars that the Union has assisted, in conjunction with the Automobile Club, in performing what may eventually prove to be one of the most important services rendered to the automobile cause since the Union was founded. On the appointment of the Royal Commission, a Joint Committee of the Club and the Union was formed (each body contributing £500 to a Defence Fund) to enable the automobile case to be adequately placed before the Commission. A number of prominent automobilists were accordingly fully heard by the Commission, and there can be little doubt that the valuable character of the evidence they tendered will become fully apparent when the Commission publishes its report.

◆ ◆ ◆

The Motor 'Bus in Berlin.

Among the advantages of not allowing locomotion, and particularly tramways, to be in the hands of an elected body which, having once committed itself to a line of policy, feels compelled to stick to it, is afforded by what is now occurring in Berlin. The Berlin General Tramway Company has become convinced of the greater advantages possessed by the motor 'bus for dealing with traffic than those provided by the electric tram, and have decided to embark on a large scale in the motor omnibus business. Unfortunately, until recently, one of those limiting and restricting laws, of which the object is usually more or less incomprehensible, prevented the tramway company from running 'buses. This has now been rescinded, and Berlin will consequently witness the spectacle, which would certainly make a Londoner rub his eyes, of a tramway company catering for public traffic by a service of up-to-date motor 'buses. Possibly, however, if we wait long enough, London may ultimately to some extent emulate Berlin in this respect, Captain Hemphill, vice-chairman of the Highways Committee of the L.C.C., having this week stated that it was *possible* that the Council some time in the future might approach Parliament for powers to run motor 'buses as feeders to their trams. The Berlin tramway company have been largely induced to take this step by the narrowness of many of the streets through which their service runs, and the congestion which naturally follows when a sufficient number of trams follow in close sequence upon one another. In adopting this policy the Berlin Tramways Company will undoubtedly benefit both the general traffic facilities of their capital and increase their own earning power.

◆ ◆ ◆

In the Enemy's Citadel.

There is only one spot in the whole world more sacred to the worship of the horse as an institution than Aldridge's, in Upper St. Martin's Lane. It is the second great centre in the country, the second head-quarters of the horse trade. We may be sure, therefore, that most of our readers will rub their eyes and wonder where they are when they see an ordinary advertisement this week announcing that no less than seven automobiles are to be sold by auction in the well-known horse fair, just as if they were so many horses. We trust there will be no ructions. If the horse, or horses (there are usually a good number of them on sale now) become restive at seeing the temple hitherto sacred to their sole worship invaded by their modern competitor in this manner, we may anticipate a stampede down St. Martin's Lane, and a public demonstration in Trafalgar Square. If any of our readers should on Thursday next, therefore, observe a body of determined and angry horses marching in procession upon the spot where the grievances of the masses have been previously aired, they will now know what the portent signified—the invasion of Aldridge's by the automobile.

◆ ◆ ◆

The "Automotor Journal" "Buyers' Guide" to Commercial Motor Vehicles for 1906.

Saturday (to-day) will see the opening at the Agricultural Hall of another in the long series of automobile exhibitions which Mr. Cordingley has organised with such conspicuous success in the past, and so greatly to the general benefit of the automobile movement. By the natural course of events, and the arrangement of other exhibitions, it may be anticipated that a prominent feature of the approaching show (especially when we consider the motor 'bus boom, which expands more and more every month, and even every week) will again be the commercial and heavy vehicles. We accordingly have selected the present occasion as a suitable one for publishing THE AUTOMOTOR JOURNAL "Buyers' Guide" dealing with the commercial and heavy automobiles now on the market. The "Guide" is exactly uniform with our tourist car "Buyers' Guide for 1906," which we published on February 17th, and will enable all who are considering the purchase of commercial vehicles to select those that best suit their requirements. The development of heavier types of automobiles has been so phenomenal during the last few months, and the demand for them has been such a rapidly increasing one, that we feel sure THE AUTOMOTOR JOURNAL "Guide" will be of general service and utility to our readers. A considerable number of the vehicles that are included in our tables are to be on view in the Agricultural Hall.

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The Police and the Motor Cab.

To predict that the general triumph of the motor omnibus will before very long be followed by an equally imposing triumph on the part of the motor cab, is a prophecy which even cautious people like ourselves may be excused for almost venturing upon. The motor cab is certainly appearing in considerable force on the streets of the Metropolis, though not yet in such force as seriously to affect the general traffic or to add much to the convenience of the travelling public. With moderate fares, and particularly, as we have hinted more than once, if it adopts the taxameter, the motor cab, when it does arrive in force, may feel assured of reaping a very satisfactory monetary harvest.

The moderate number of motor cabs at present on the London streets is no doubt to a large extent due to the difficulties inherent in designing a thoroughly satisfactory vehicle. There has been far too much tendency to take chassis that are originally intended for touring car purposes, and simply finish them off as cabs by attaching more or less suitable bodies to them. This by no means necessarily makes a satisfactory vehicle for London streets. The attitude of the police, too, as licensing authorities, has been decidedly cautious and conservative. The licensing of motor cabs as hackney vehicles comes under the provisions of the Act of 1869, under which the police have made certain regulations, most of which of course do not apply to motor vehicles at all, but to their previously published regulations they have added the further requirement that every motor cab must be able to turn round in a radius of 25 ft. Opinions are rather divided as to the wisdom of this requirement. Those makers who have succeeded in constructing cabs that comply with it are not much opposed to it. Others, of course, regard it as a piece of red tape. That a motor cab should, however, be able to turn round in most of our London streets without backing certainly seems desirable, and this it would appear is what the police have been aiming at.

◆ ◆ ◆

The Whole Subject in a Bit of a Muddle.

The situation at present savours somewhat of bemuddlement. It is no great wonder that this should be so, when motor vehicles have to be brought under the provisions of an Act passed as long ago as 1869. The police have published certain regulations which must be fulfilled before they grant the certificate of fitness—an indispensable condition to obtaining a licence, for which £2 has to be paid. These regulations comprise some antique provisions which it would be rather funny should the police insist on enforcing with regard to motor cabs. Among these may be mentioned :—

> "That all carriages fitted with noiseless or rubber-tyre wheels have bells affixed either to the carriage or to the harness of the horses drawing the same.
>
> That an iron frame and chains, or some equally efficient means for securing luggage carried on the roof, are fixed on the outside of all four-wheeled carriages."

while in addition a special attempt is made to deal with self-propelled vehicles by the following provision :—

> "Proprietors of carriages propelled by mechanical means will be required to furnish a certificate from an independent firm of engineers that each carriage submitted for licensing is, so far as the mechanism is concerned, fit for public use."

—a naive provision, which no manufacturer is the least likely to have any difficulty in fulfilling, while over and above these requirements there is the provision referred to above, of turning in a 25 ft. radius. When, however, you have fulfilled these and all the other police regulations, it does not follow by any means that you get your certificate of fitness, for to the regulations is appended the following suggestive note :—

> "NOTE.—Though the above conditions may have been complied with, yet if there be anything in the construction, form, or general appearance which, in the opinion of the Commissioner, renders the carriage unfit for public use, it will not be licensed."

Practically, therefore, the licensing of a vehicle rests entirely with the discretion of the particular police officials concerned. As regards the legality of the position, it often happens that on probing into things of this kind, surprises are forthcoming. According to a special Act, all regulations made under any Act of Parliament have, we understand, to be laid on the tables of both Houses of Parliament. One cannot help wondering if this has been done in the present case, and whether, if so, the somewhat humorous note quoted above formed part of them.

◆ ◆ ◆

A Select Committee on the Question.

The whole position therefore is, as will be seen, in a far from satisfactory condition, and includes elements of the absurd and incongruous as well as of the antiquated, and we accordingly trust that the proposal to appoint a Select Committee to inquire into the whole question and make its recommendations to Parliament will speedily be carried out. The terms of reference to the proposed committee include :—

1. The licences of drivers and conductors and the measures required to prevent the use of licences by unauthorised persons.
2. The restrictions imposed on cabs with regard to the carrying of passengers.
3. The treatment of cabs by the railway companies.
4. The structural requirements to be enforced in the case of motor cabs and omnibuses.
5. The readjustment of cab fares, in connection with taxameters, nd extension of the four-mile radius.

It is to be hoped the committee will report quickly, as legislation is obviously needed. This branch of the industry cannot be expected to attain full development while the law and the police regulations made, whether legally or not, are in their present condition. Early legislation is, therefore, needed, and we trust that the committee in question will get to work as soon as they can, and present a report which may as soon as possible form the basis for framing a useful and comprehensive Bill. In the meantime, perhaps, the police will be good enough not to take too rigid an attitude on the question, and above all remember that the 25 ft. radius test, though perhaps desirable as an ideal, might, at any rate as far as pioneer motor cabs are concerned, be relaxed to a certain extent without very seriously endangering the public safety.

⊕ ⊕ ⊕ ⊕

THE statements in the Press that the Board of Trade has sanctioned a speed limit for tramcars of 16 miles an hour in some parts of London, appear, from a statement made by the Board to the Roads Improvement Association, to be premature.

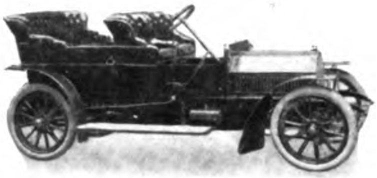
How to Recognise the Cars of To-day.

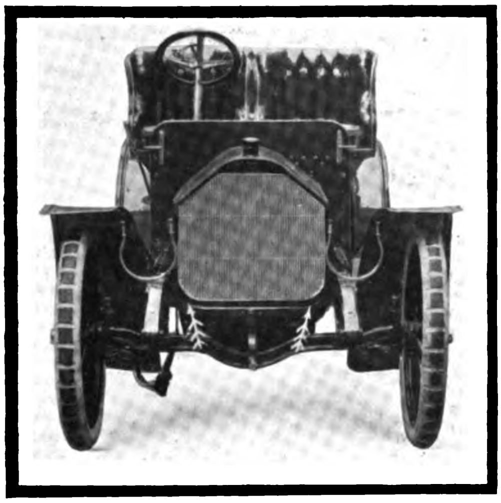
(No. 13).

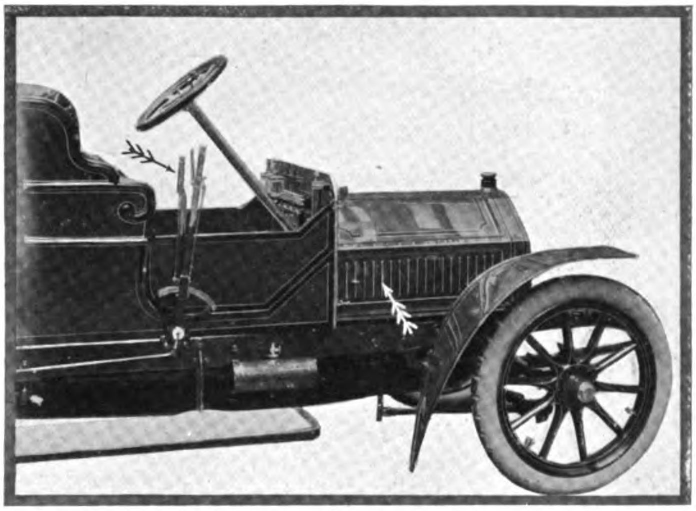
The Regent.

(GERMAN)

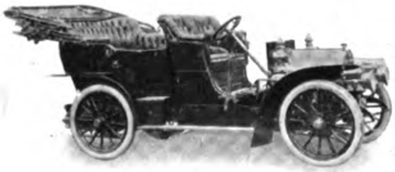
18 H.P.







The Regent Car is not easily distinguishable at first sight, but two important details are the LOUVRES IN THE SIDES OF THE BONNET and the ROUNDED CORNERS at the bottom of the honeycomb RADIATOR. Another feature is the CHANGE SPEED LEVER, which operates over a "STRAIGHT THROUGH" QUADRANT. DOORS are also fitted between the front seat and the Dash.

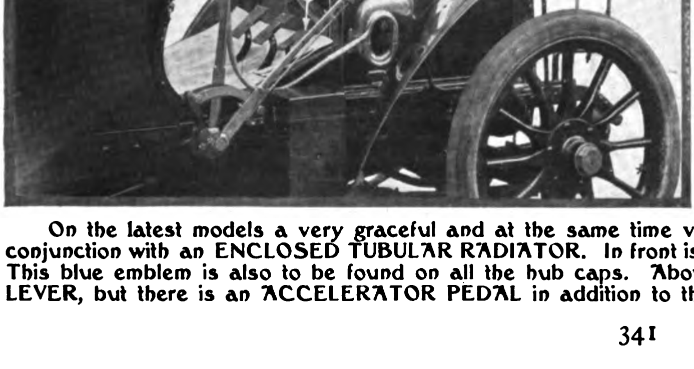


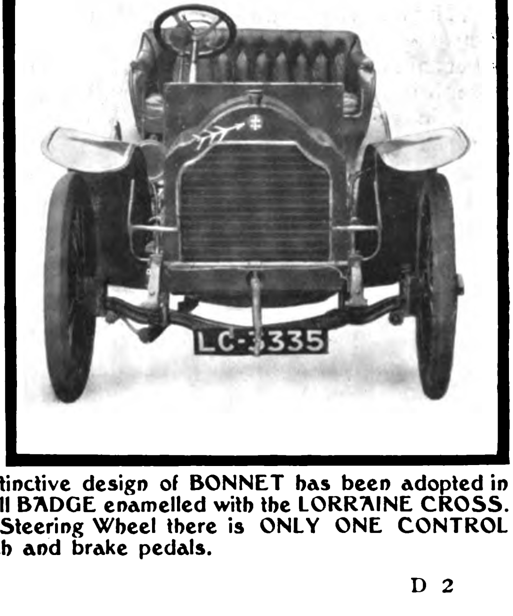
(No. 14).

The De Dietrich

(FRENCH)

12-15, 16-20, 24-30, 40-50 & 60 H.P.





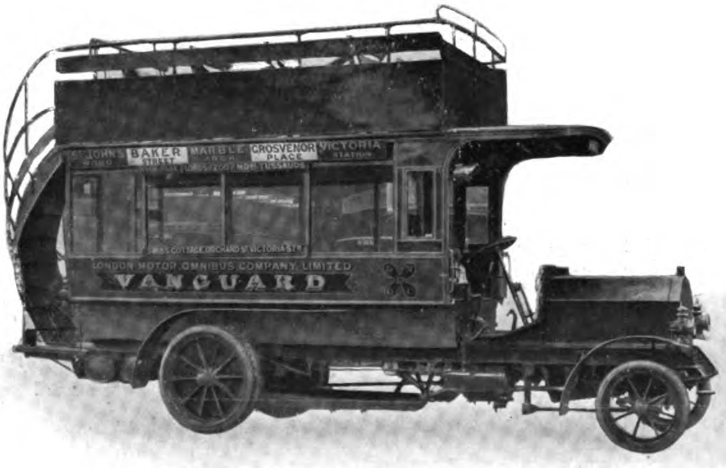
On the latest models a very graceful and at the same time very distinctive design of BONNET has been adopted in conjunction with an ENCLOSED TUBULAR RADIATOR. In front is a small BADGE enamelled with the LORRAINE CROSS. This blue emblem is also to be found on all the hub caps. Above the Steering Wheel there is ONLY ONE CONTROL LEVER, but there is an ACCELERATOR PEDAL in addition to the clutch and brake pedals.

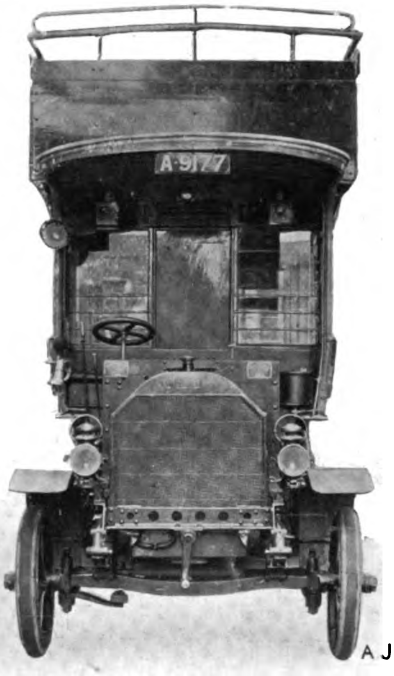
How to Recognise the Motor 'Buses of To-day.

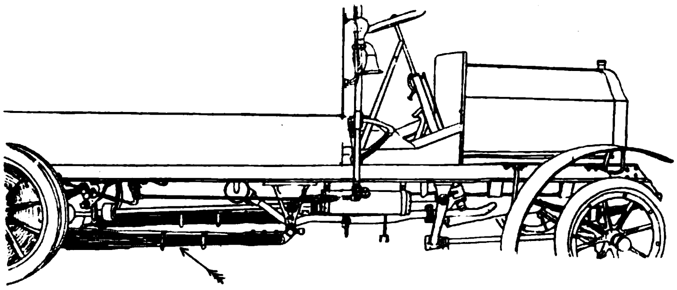
(No. 1).

Milnes-Daimler.

(GERMAN).







These vehicles are manufactured by the same firm as the famous Mercedes Touring Cars, and they have the same type of BONNET AND RADIATOR. At each side, beneath the frame, is a long WOODEN BEAM which takes the place of a radius rod, and it is by these that the vehicles can be most easily identified when passing.

'Bus and Cab Drivers the Best Motor Drivers.

It is satisfactory to hear that the motor omnibus companies declare that the men who make the best drivers are former horse 'bus drivers and cabmen. They learn, it is stated, quicker than others, and being at home in traffic are much more reliable, and possess the control over their nerves and tempers which is so absolutely essential. It is pleasing to learn that this is the case, as many people fancied that the advent of the motor would mean considerable distress for the men who, in many instances, are finding their occupation gone from no fault of their own.

A Petrol Famine?

It would seem that the immense increase in the consumption of petrol, which the addition of motor 'bus development to ordinary car consumption is occasioning, begins to make itself felt in the price of petrol. The *Petroleum World* calculates that 500 motor 'buses running for a year would alone consume a grand total of 3,000,000 gallons. The price of petrol, at any rate, has gone up ½*d.* per gallon, and our contemporary assumes that this rise is due to the enormously increased demand. But with products of the oil wells one never really knows. It may be only "manipulation" after all. If the demand goes on increasing, and no new sources of petrol are discovered, we may all agree with the *Petroleum World* that a rise is certain.

A Belgian Wonder.

There is no age limit as far as youth is concerned in the manifestations of genius, and there is equally no limit, apparently, to what the descriptive reporter will do with a subject he only imperfectly understands. As an example of both, we quote the following, which it would be a decided pity to alter by a single word:—

> A girl of this town (Antwerp), not yet fifteen years old, has patented a remarkable invention, consisting of a turn-table for reversing the direction of motor cars. The apparatus is fixed on the chassis, which has a driving-wheel at each end, and is worked by an electric motor. The invention was the outcome of watching the difficulty of manœuvring heavy motor wagons in the Antwerp streets.
>
> After watching the motor wagons for some time one day, the girl went home and by the next morning had a complete scheme for the turn-table. Two motorists who were visiting her father fetched a designer, and the plans were at once drawn up at the child's directions.

THE HUMBER PETROL CARS.

FOUR AND SIX-CYLINDER MODELS.

Few cars have been attracting more attention of late than have the products of the famous Humber Works, particularly now that they are making both 4-cylinder and 6-cylinder models. With steady persistency the engineers responsible for the design of these vehicles have been adding improvement after improvement, while always keeping in check that most important of factors—cost of of production. As a result the Humber Company are building cars which embody most of the best principles of modern practice, while retaining that desirable moderation in price which enables them to be "popular" by directly appealing to the pockets of the majority. Of these vehicles, we purpose dealing chiefly, in the present article, with the cars constructed at Beeston, under the superintendence of Mr. T. C. Pullinger. These consist of two models:—the 16–20-h.p., which has a 4-cylinder engine, and the new 30–40-h.p., which has a 6-cylinder engine. Both are in general respects similar, but on the larger model a spring-drive device has been incorporated which allows the engine to make three-quarters of a revolution before the road-wheels need begin to move. An additional foot-brake enclosed in the back-axle casing is also fitted, but the other details coincide for the most part with those now fitted on the 16–20-h.p. car. Turning our attention in the first instance to the details of the 16–20-h.p. car—the chassis of which is

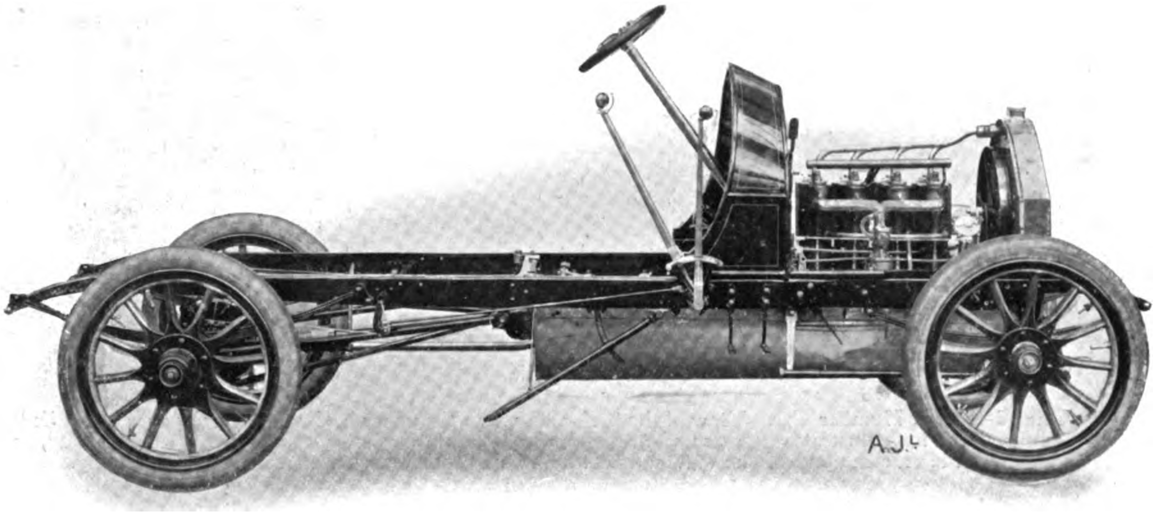


Fig. 1.—The 16-20-h.p. Humber Car. Side view of the chassis, showing metal sheath beneath engine and gear, which is fitted in order to protect them from dirt. The sprag is also visible, and it will be noticed that it is attached to a quadrant guide in order to steady it.

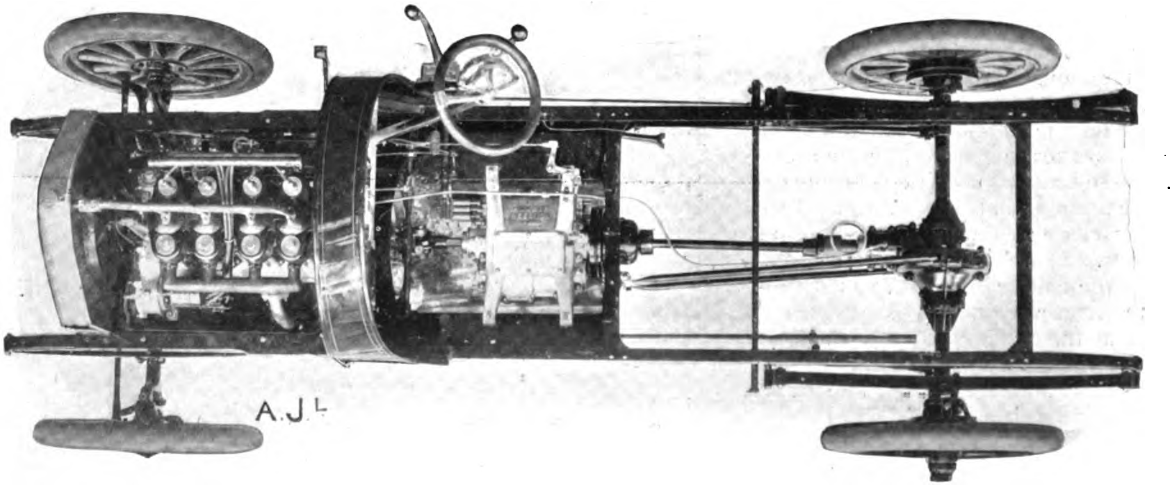


Fig. 2.—The 16-20-h.p. Humber Car. View of the chassis from above, showing the arrangement of the gear-box. Alongside the propeller shaft is seen the triangular torque-rod which ties the axle-casing to the frame and prevents it twisting round under the driving strain.

seen from the side and from above respectively, in Figs. 1 and 2—this has, since last year, undergone some important modifications, although in general it retains the characteristics of its predecessor.

In this, its latest form, it has a typical live-axle chassis and is fitted with a 4-cylinder engine in which has been embodied a special system of lubrication. The power is transmitted through a leather cone clutch to a 4-speed "Mercedes" gear-box, in which both shafts run on ball-bearings, and from this the drive passes through a universally jointed propeller shaft to the live-rear-axle. In this latter member such modern improvements as a horizontal division to the differential casing, and an extra bearing for the bevel pinion, have been adopted, while the road wheels run on tubular extensions of the axle casing and are fitted with ball-bearings.

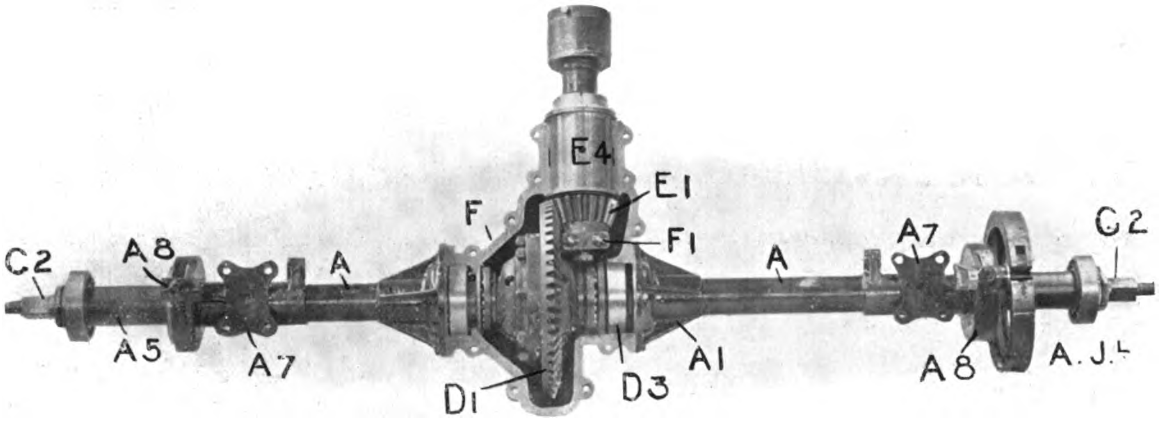


Fig. 3.—The 16-20-h.p. Humber Car. View of the back-axle when the upper half of the casing over the differential has been removed. This illustrates the accessibility of the bevels and shows the additional bearing, F^1, which supports the extreme end of the driving-bevel spindle and so prevents it from being overhung.

The 16–20-h.p. Back Axle.

In Figs. 3, 4 and 5 the details of the back axle construction are clearly indicated.

Surrounding the live-axle, C, is a stationary tubular casing, A, which extends on either side of the differential casing, F; the solid drawn steel tubes, A, being rigidly fixed to the central casting, F, by means of the flanges, A^1. Near their outer ends the tubes, A, are fitted with brackets which support the springs on the flat-plates, A^7, and hold the side brakes in position by the arms, A^8. These brackets are visible in Fig. 3, but the arrangement of the various parts is most clearly shown by the drawing in Fig. 5. Quite close to the bracket is one of the ball bearings, A^4, which support the road wheels, the other, A^3, being placed at the extremity of the tube, A. It will be noticed that the two ball bearings, A^3 and A^4, are not the same size, the inner bearing, A^4, having the larger diameter. This is in order to enable the inner bearing to be more easily fixed in position and removed, and on the same grounds it facilitates the removal of the wheel itself—which is the more important fact from the motorist's point of view, because it is seldom necessary to take down the bearings themselves. Another point to be noticed is that the bearings are placed on the axle casing so that they are between that stationary member and the wheel, instead of being between it and the live shaft. There are several obvious advantages in this construction; for instance, it enables the bearings to be of a much larger diameter than they can conveniently be made if they immediately surround the axle. Besides this, it allows the axle itself to be of minimum weight and of uniform thickness throughout because the revolving shaft carries no load, being merely subjected to the simple torsional driving strains. Between the two bearings, A^3 and A^4, is a distance sleeve, A^5, so that the lock-nuts, A^2, securely fix both bearings in position.

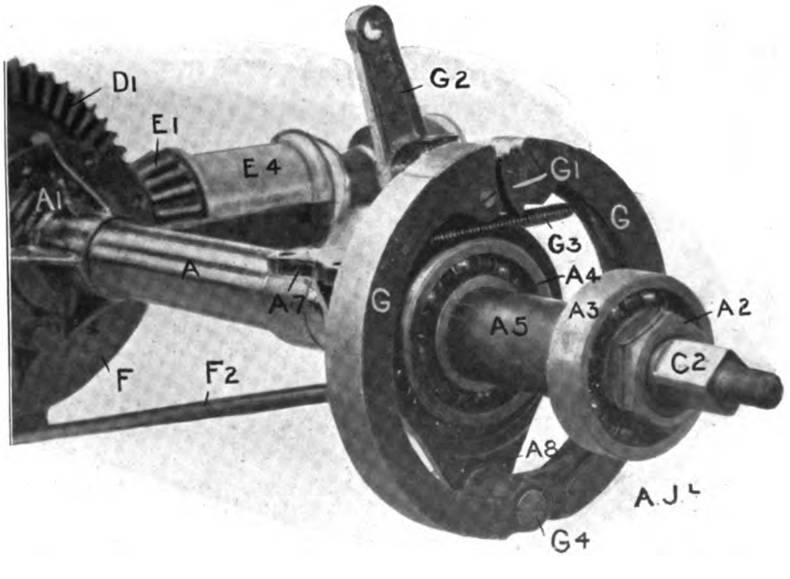


Fig. 4.—The 16-20 h.p. Humber Car. View showing one end of the back-axle after removing the road wheel. The road wheel is carried by the two ball bearings, A^3 and A^4; its weight is, therefore, supported by the end of the axle-casing, and not by the live-axle itself, which merely drives the wheel through the square coupling, C^2. One of the internal expanding brakes is very prominent in the view, and the rocking wedge, G^1, by which the shoes, G, are forced against the drum, can also be quite clearly seen.

No loose pieces are employed for transmitting the drive from the projecting end of the shaft, C, to the road-wheel, the hub, B, being cast with a square socket, B, which engages direct with the corresponding end, C^2, of the live-axle. The wheel is retained in place by the nut, C^1, while the live-axle is similarly secured by a nut, C^5, at its inner end. For lubrication, the entire hub is filled with grease, and a dust-tight joint is formed at the inner side by the soft washer, A^6.

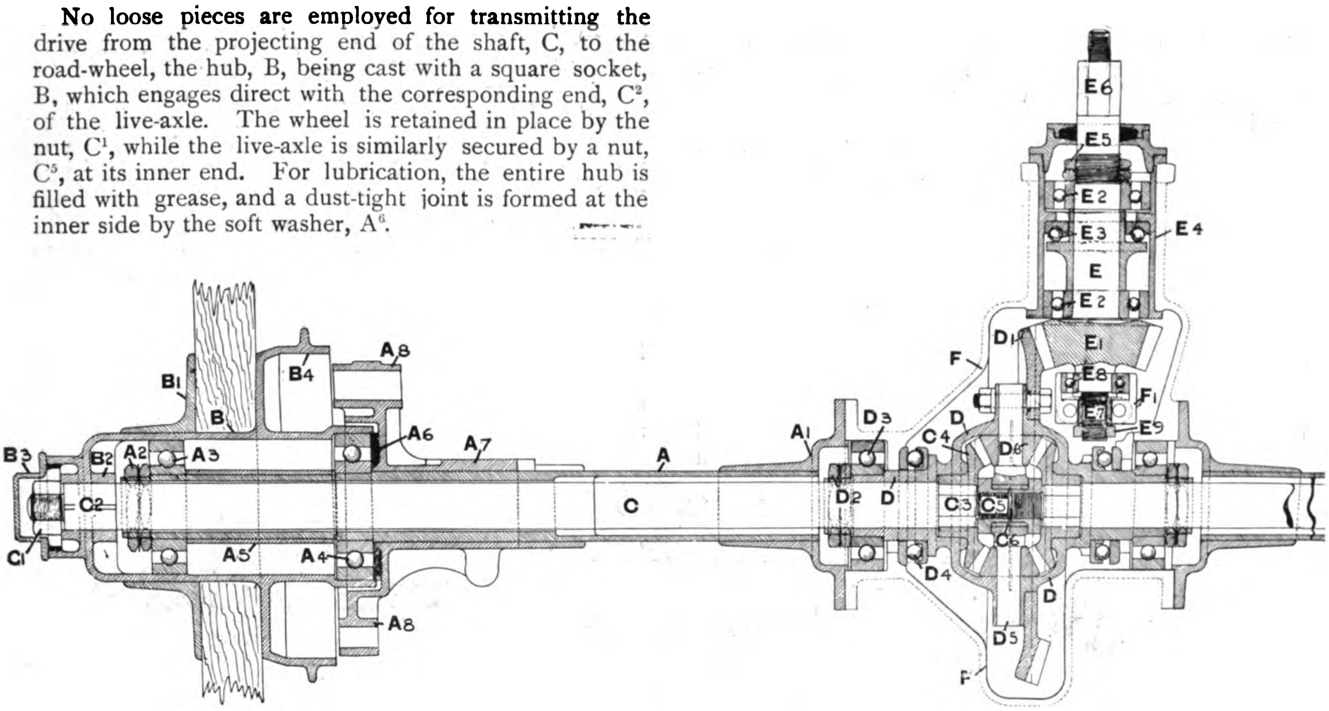
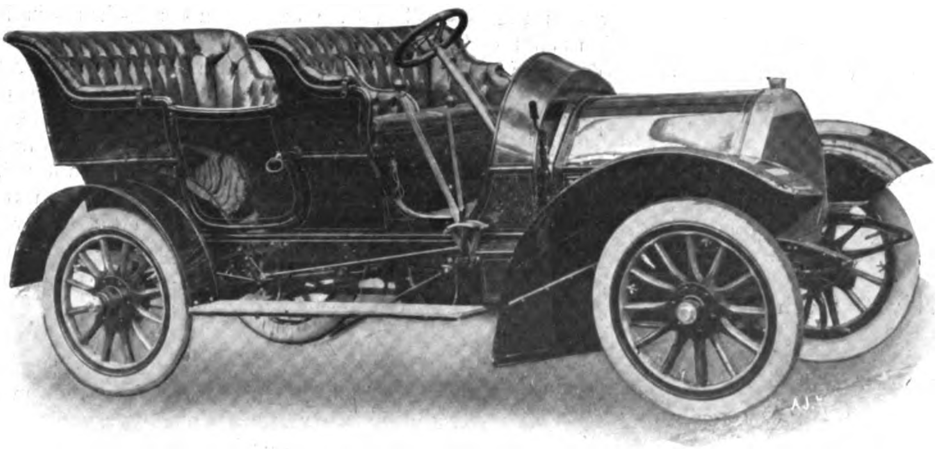


Fig. 5.—The 16–20-h.p. Humber Car. Sectional drawing illustrating the internal construction of the back-axle. This clearly shows the mechanism of the differential and the manner in which the halves of the live-axle itself are connected by it. For convenience only half the complete drawing is reproduced, but the ends, which carry the road-wheels, are, of course, alike.

The internal construction of the differential-gear is also very clearly indicated in Fig. 5, but Fig. 3 shows how the casing, F, is divided by a horizontal joint in order to facilitate a thorough inspection without taking down the axle. The live-axle, C, is, of course, in two parts, and the inner ends, C^3, of each, terminate inside the differential-box, D, where they carry the bevel-wheels, C^4, which are secured in place on the hexagon-ends of the shaft by the nuts, C^6. It will be noticed that the nuts, C^5, are turned down—so that they are partly cylindrical on the outside—and fit into a common sleeve, C^6, which keeps the two shafts in alignment. Surrounding this sleeve, C^6, is a steel ring, from which project four spider arms, D^5, for the purpose of carrying the small bevels, D^6, of the differential-gear. The outer ends of the arms, D^5, are clamped between the flanges of the differential-box, D, so that the spider affords a rigid support for the sleeve, C^3, which aligns the ends of the live-axles. Ball-bearings, D^6, carry the differential-box, D, itself, and the bearings are locked in place by the nuts, D^2.

It is obviously impossible to remove the differential-box, D, from the casing, F, in one piece, because in order to do so it would first be necessary to draw out the live axle, and this is prevented by the nuts, C^5. If it is essential, therefore, to take out the differential-box for repair at any time, the car must be chocked up, and the axle-casing, A, itself taken down, and separated from the differential-casing, F. After breaking the joint in the differential-box, D, the nuts, C^5, can be removed, and each half of the box drawn off the live-axle separately.

Bolted to the flanges of the differential-box, D, is the large bevel-wheel, D^1, which is driven by the bevel-pinion,

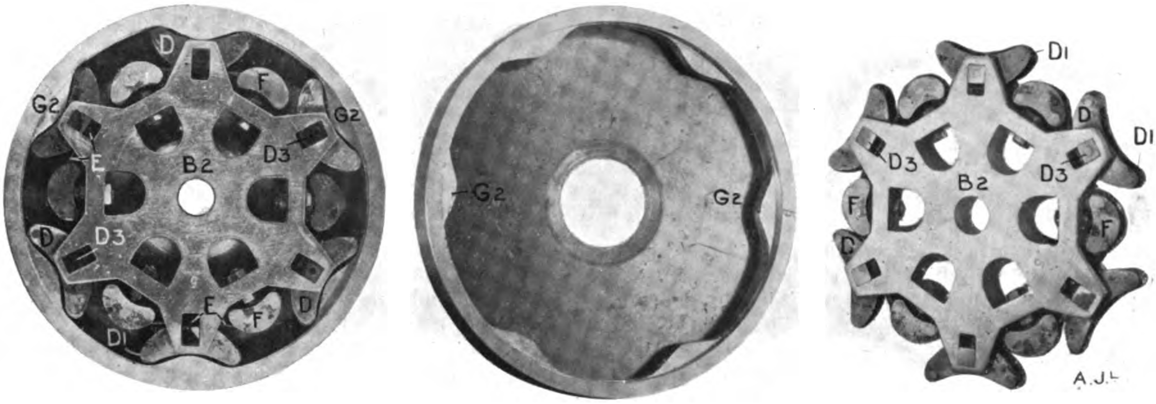


The 16–20-h.p. Humber Car.—One of the new 16–20-h.p. Humber cars fitted with the standard side entrance body. In this model ball bearings have been fitted throughout the transmission, and the control levers have been placed above the steering-wheel.

E^1, from the propeller-shaft. Thus the box itself forms one of the principal members in transmitting the power, although it is, of course, in no way *rigidly* connected to the live axle. From the box the power is transmitted through the spider, D^5, to the small bevel-pinions, D^6, which mesh with the bevel-wheels, C^4, on the live axle. Normally, the pinions, D^6, do not revolve about their spindles, D^5, but merely act as tie bars between the wheels, C^4. Whenever the car is travelling round a curve, however, the outer wheel is caused (by the car) to travel faster than the inner wheel. In consequence, the respective bevel-wheels, C^4, also revolve at different speeds, and in doing so make the pinions, D^6, rotate about their spindles, D^5. With the clutch engaged and the engine driving, this differential action has no effect on the speed of the box, D, and the increase in speed of the outer wheel is, therefore, accompanied by a corresponding decrease in speed of the inner wheel. The driving bevel pinion, E^1, is formed solid with its spindle, E, but the spindle itself is separate from the propeller-shaft, being coupled to it by a universal joint. There are two ball-bearings, E^3, placed at a considerable distance apart, behind the pinion, and an excellent feature in the construction of this gear is the provision of another ball-bearing, E^8, on the other side. This additional bearing prevents the pinion, E^1, from being "overhung"; it is not always easy, however, to find room for such a bearing inside a differential case, and in this instance it is interesting to notice that the box, D, is placed behind the bevel wheel, D^1, instead of. as is more usual, in front, by which arrangement sufficient room is available for the bracket, F^1, which supports the bearing, E^8.

(*To be continued.*)

THE EMPIRE SPRING WHEEL.



The Empire Wheel.—Three views, taken of a model, illustrating the latest design for the "heavy type" wheel. Only the centre portion of a complete wheel is shown, the outer rim, which may be of any diameter, being suitably attached by spokes or stamped "discs."

OUR readers are already familiar with the principles and general construction of the Empire spring wheel, which has been designed by Mr. A. S. F. Robinson. In a previous article we dealt very fully with the various types which had then been built, but Mr. Robinson has now evolved another pattern which, it is hardly surprising to find, embodies the leading characteristic features of the more important earlier types. This latest design is illustrated by photographs which we have taken of a small model.

Only the centre part of the wheel is represented, in which respect it may be compared with the corresponding portion of the wheel illustrated in Fig. 10, page 1297 of our issue of October 21st, 1905. Certain details of the type there described will be recognised again in this model, but, on the other hand, the trolleys, D, and the rockers, F, are both carried by the centre member, B^2, in very much the same way as they were in the earlier type, which we described and illustrated in the same issue.

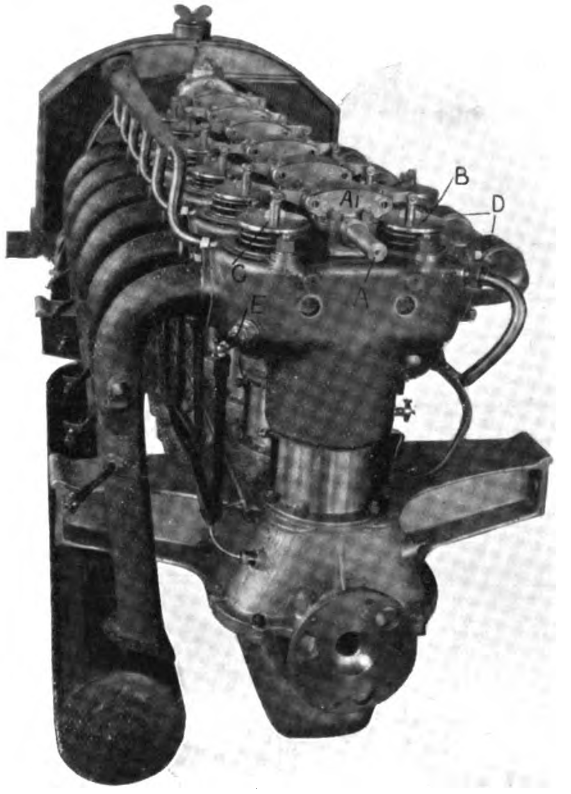
As a result, Mr. Robinson has evolved a very substantial wheel for commercial vehicles, in which the original principles are embodied in an improved form. Owing to the use of the double roller type of trolley, D, practically no side-thrust is imposed on the trolley-guide, D^3, as was the case in the type illustrated in Fig. 11 of the article already referred to, while another advantage is that the springs are no longer drilled to receive holding-down bolts, their ends are hooked over the saddle on the rocking-beams instead, to prevent their displacement. It will be noticed, too, that the compensating rockers are carried on bolts, so that the stiffness of the springs can be readily adjusted. This feature was omitted on previous models of "heavy-type" wheels, although prominent on the original touring car model first constructed.

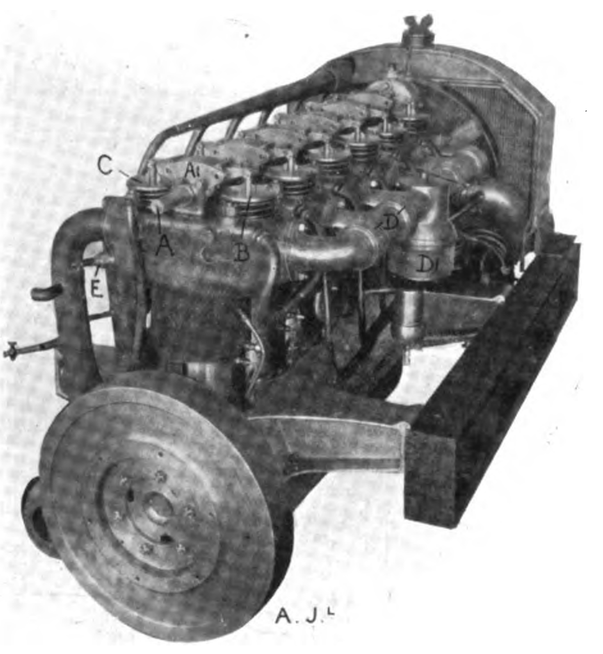
The Automobile Association

Is still further elaborating its programme. To the form of activity which has made it a familiar and useful institution to motorists generally, it is adding a propaganda for securing (1) close trimming of hedges at cross roads, (2) display of the names of villages and hamlets at each end thereof, and (3) restoration and improvement of unsatisfactory direction posts, while in addition they are establishing a confidential information bureau referring to every main trunk road. The importance of these new departures for automobilists speak for themselves, and the Association is certainly to be congratulated on its enterprise and energy.

SIX-CYLINDER MERCEDES ENGINES.

THERE are many reasons why the powerful 6-cylinder engines, built for the latest Mercedes racers, should be particularly interesting to our readers, for not only is it significant that the 6-cylinder principle should have been adopted by this celebrated firm on their racing cars, but these new engines are of a totally different design in many important respects from any previous Mercedes models. The three cars which are to represent the Cannstatt Daimler Company in the Sarthe Circuit for the Grand Prix next June are fitted with engines of this type, while we also understand that Mr. W. K. Vanderbilt also intends to acquire one for competing in American racing events this year.





The accompanying illustrations, which have been prepared from original photographs kindly sent to us by the editor of the *Allgemeine Automobil-Zeitung*, of Vienna, show one of these engines from two different points of view; that on the left—with the fly-wheel removed—enables the exhaust-valve side to be seen, while, in the other photograph, the carburettor is prominent on the other side. In both cases, the honeycomb radiator—which is made of steel—is seen fixed in place at the front end of the engine, but, except on the extreme right, the test-bench on which the engine was resting has been cut away by us for the sake of clearness.

Quite the most noticeable departure from previous Mercedes practice is the arrangement of the cam-shaft, A, centrally above the cylinders, somewhat in the same manner that has for some time been customary on the well-known Maudslay engines that are built in Coventry. It is, moreover, driven through an intermediate vertical shaft, that passes up from the front end of the crank-shaft, with the interposed gear-wheels enclosed in oil-tight cases. The inlet, B, and exhaust-valves, C, do not, however, lie beneath the cam-shaft, for, except that they are slightly nearer together than usual (and are, of course, inverted), they occupy much their orthodox positions in valve-chambers that project on each side of the cylinder heads. Their operating cams are enclosed in neat casings, A^1, that also serve the duty of supporting the short pivoted rock-levers, and each valve is held down in place from above by a pair of studs and nuts.

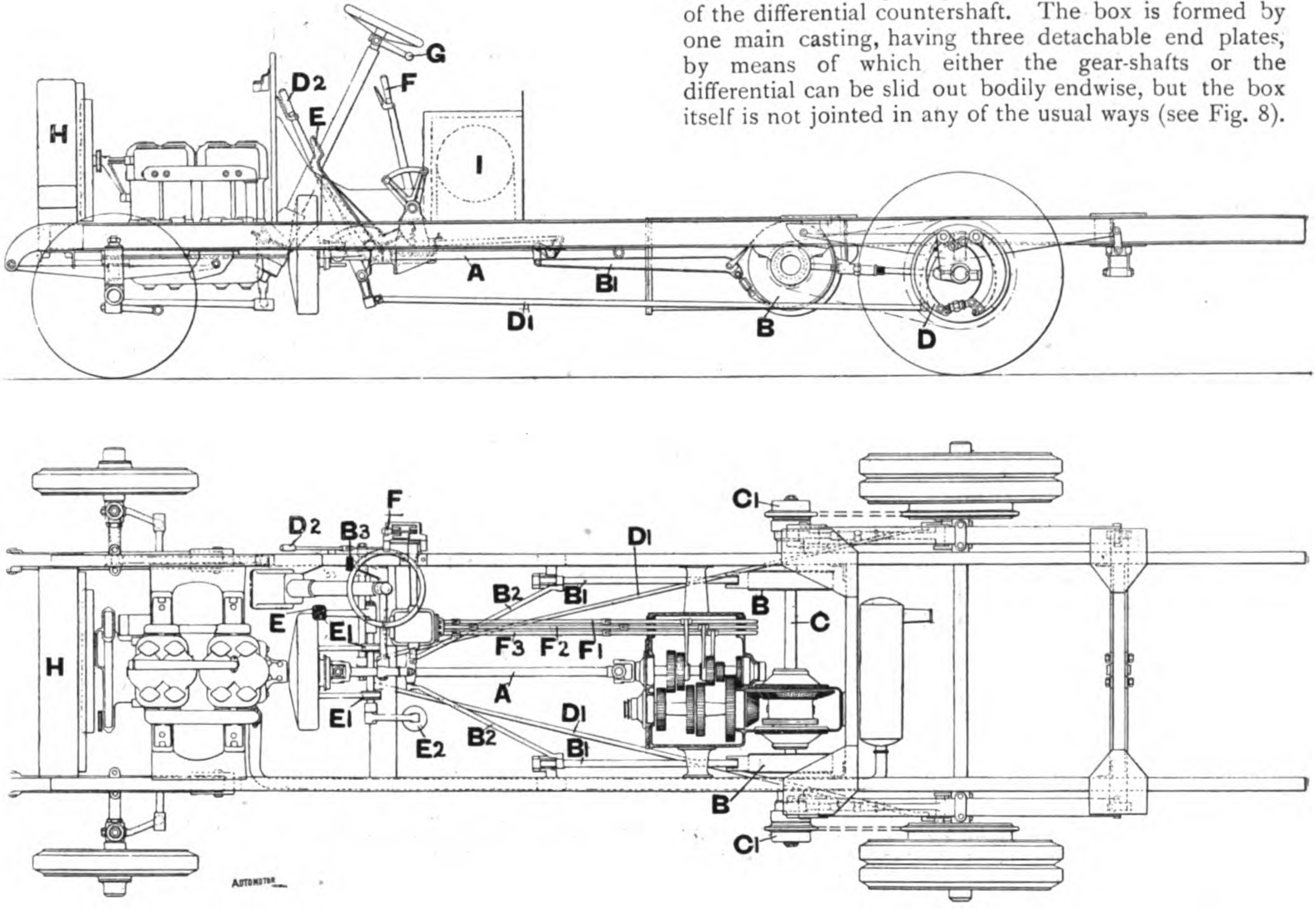
Concerning the actual constructional details of the cylinders we are not at present able to speak with certainty, but we understand that each cylinder is machined out of a billet of special steel, and that the cylinder-heads, together with the water-jackets, are steel castings. Each cylinder is, it will be observed, bolted independently to the crank-chamber, the upper portion of which has four projecting feet for direct attachment to the chassis. The cylinders have a bore of 160 mm., and a stroke of 150 mm., so that the actual power available is probably about 135 to 145 b.h.p.

One carburettor, D^1, serves for all the cylinders, but special provision is made for preventing the long, straight induction pipe from imposing any twisting strains on the cylinders when they become heated, for there are concertina-like expansion joints, D, introduced in it between cylinder and cylinder. On the other side, separate exhaust-pipes are led to a cylindrical silencer beneath.

All the gear-driven parts—the magneto, the pump, and the vertical shaft—are arranged at the front of the engine, as also is the fan which draws air through the radiator. Remarkable, in its way, is the fact that the Simms-Bosch magneto is of the high-tension type, used in conjunction with the jump-spark ignition-plugs, E, for hitherto a low-tension system has always been a feature of all Mercedes engines.

THE CRITCHLEY-NORRIS PETROL 'BUS.

ANOTHER entirely new make of motor 'bus—of British manufacture throughout—is now appearing on the market for the first time, and is to be brought before the notice of the public at the Agricultural Hall Show that opens to-day (Saturday). In many important respects it differs from any of the motor 'buses now in use, for its designers, Mr. J. S. Critchley, M.I.M.E., and Mr. W. Norris, M.I.M.E., A.M.I.C.E., have not merely contented themselves with incorporating the best features of other vehicles, but have also adopted some distinctly novel characteristics of their own. They have recently acquired and equipped large works at Bamber Bridge, near Preston, and—as the Critchley-Norris Motor Company (a branch of Messrs. Peter Pilkington, Limited)—are already turning out these heavy vehicles for commercial purposes. Incidentally, it may be added that they also intend to manufacture pleasure cars, and that in all cases their vehicles are to be fitted with the well-known Crossley engines, which, it will be remembered, are also built to the designs of Mr. Critchley.



Figs. 1 and 2.—Side elevation and plan of the Critchley-Norris Motor 'Bus Chassis, showing the general arrangement of the entire mechanism.

The motor 'bus chassis, of which we are now able to give full particulars, has been so designed that either the 30-h.p. or the 40-h.p. engine—both of which were described in our issue of February 3rd last—can be fitted, and one of the chief objects of the designers has been to ensure accessibility throughout the entire transmission mechanism. Special care has, moreover, been taken in the selection of suitable material for each and every part, while the chassis as a whole, with its massive channel-steel frame, is decidedly substantial.

Special Features.

Briefly enumerating the more unusual characteristics of this chain-driven vehicle, for the benefit of those who do not wish to follow us into a closer study of its many interesting constructional details, attention should first be directed to the 4-speed gear-box and to the arrangement of the differential countershaft. The box is formed by one main casting, having three detachable end plates, by means of which either the gear-shafts or the differential can be slid out bodily endwise, but the box itself is not jointed in any of the usual ways (see Fig. 8). Then, too, not only are all the shafts mounted in large ball-bearings, with adjustable ball-thrust collars behind each bevel-wheel, but the two facing bevel-wheels, which form a part of the differential gear, have their own ball-bearings inside the shell casting in addition to the external ball-bearings that support the shell. This novel design for the transmission gear is one of Messrs. Critchley and Norris's latest inventions, a further feature of which is that the end-bearings for the countershaft enable either half of the countershaft to be drawn out from the side of the chassis without disturbing the differential gear (see Fig. 10).

Other noticeable points in connection with the transmission, are the rubber cushions inside the sprockets, for

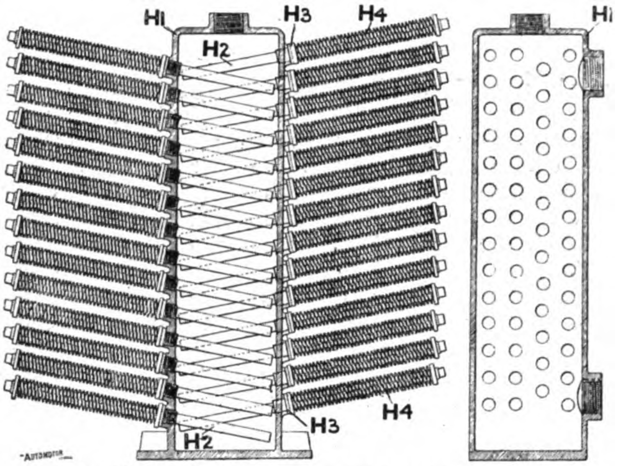


Fig. 3.—Front elevation and cross-section of the special radiator fitted to the Critchley-Norris Chassis. In this radiator each of the hermetically-sealed "Kitchen" tubes forms a separate cooling unit, so that the breakage of one tube does not materially affect the radiator, or cause any leakage of water.

giving a spring-drive action; the cone-clutch with its self-contained thrust, its cushioning dash-pot, and its substantial operating mechanism; and the compensated brakes on the two halves of the differential countershaft, in addition to the two interconnected hub-brakes.

Two or three other novel features relate more or less to the engine and its control, for not only is a very remarkable form of radiator employed, but the lubrication is effected on a new system, and a single lever serves for regulating the "time" of ignition and the throttle-valve. The radiator is built up with a number of easily replaceable sloping tubes, which project outwardly from a central water-tank through which the water is circulated. Inside the tubes themselves—and each tube is an entirely distinct unit, which, however badly damaged, does not affect the rest of the radiator—there is nothing but a small quantity of alcohol and a certain amount of rarefied air, for the tubes are sealed at both ends, and are partly exhausted by a vacuum-pump after the spirit has been introduced. The projecting portions are fitted with radiating coils for dissipating the heat rapidly to atmosphere, and the alcohol serves the purpose of quickly transmitting the heat from the circulating water to the tubes. This radiator is built to their special designs by the Critchley-Norris firm, but the "Kitchen" tubes are made by the Lune Valley Engineering Company under their own patents.

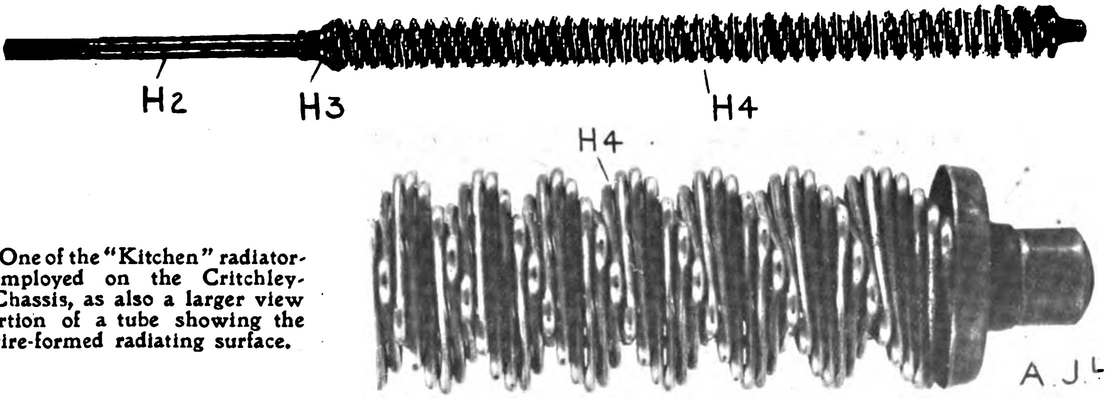


Fig. 4.—One of the "Kitchen" radiator-tubes employed on the Critchley-Norris Chassis, as also a larger view of a portion of a tube showing the neat wire-formed radiating surface.

Of the lubrication system, we are unable to give full particulars at present, but it may be said that the oil is first forced up from a supply-tank through three sight-feeds on the dashboard, and is afterwards forced down the feed-pipes to the engine by air supplied under pressure by a pump on the engine; the sight-feed glasses contain glycerine, up through which the drops of oil rise.

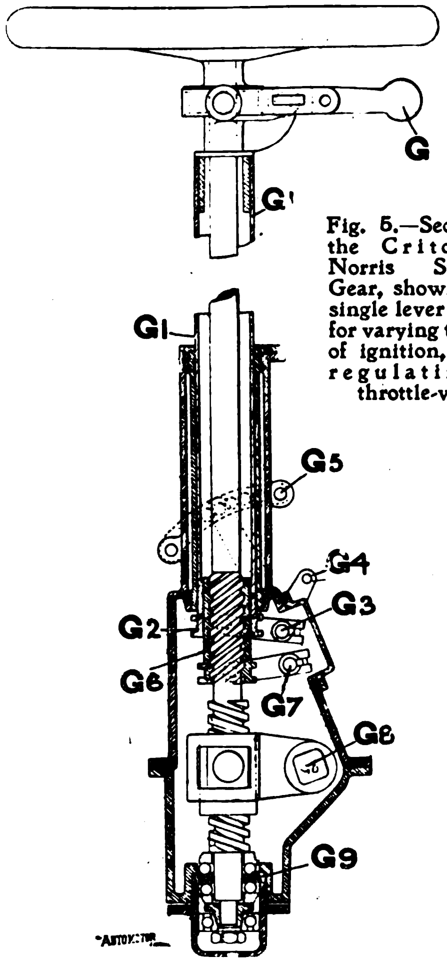


Fig. 5.—Section of the Critchley-Norris Steering-Gear, showing the single lever control for varying the time of ignition, and for regulating the throttle-valve.

For regulating the power and the speed of the engine, there is a single lever mounted on the steering-pillar, just beneath the wheel; it can be moved up or down about its pivot—thus varying the time of ignition—and it can also be moved sideways around the steering-pillar in order to open or close the throttle-valve.

Chief Dimensions.

Primarily intended to take an ordinary double-deck 'bus body, seating 16 inside and 18 outside passengers, the chassis has an overall length of 19 ft. 3 ins., with an overall width of 6 ft. 10 ins. The main frame has a channel cross-section 4¾ ins. deep by 2¼ ins. wide by

¼ in. thick, and it clears the ground by about 1 ft. 11 ins. All four wheels are made of steel, and these are shod with 5-in. solid rubber tyres—twin tyres on the 36-in. driving-wheels and single tyres on the 30-in. front wheels. From centre to centre the axles are 12 ft. 7 ins. apart (wheel-base), and from centre to centre of the rear wheels the track is 5 ft. 9 ins.

Both the 30-h.p. and the 40-h.p. engine are intended to run at a normal speed of 800 revs. per min., and the transmission-gear is so proportioned that the four forward gears then represent 3, 6, 9, and 12 miles an hour, respectively. The bore and the stroke of the smaller engine are 4¼ ins. and 5⅛ ins., respectively, and the corresponding dimensions of the larger engine are 4¾ ins. and 6 ins.

Constructional Details.

Comparatively little need be said about the general arrangement of the chassis, for this is clearly shown in the side elevation and the plan given in Figs. 1 and 2. There it will be noticed that the two channel side-members are quite straight, that they are strongly braced together by cross-members as well as by the engine and the gear-box, and that they project rearwardly some little distance behind the last cross-member. Further than this, it will be seen that an inverted transverse spring connects the rear ends of the back-springs together, that universal-joint shackles are interposed between them, and that the inner ends of all four side-springs are attached to the main-frame by sliding guide-blocks instead of by swinging links. Both the engine and the gear-box are fixed direct across the frame, the former having specially-shaped brackets bolted to the side-members in order to receive the projecting feet of the crank-chamber, and the latter being secured in a similar manner at each side as well as by a third fixing at the back to a cross-member. Of the change-speed-gear, the differential countershaft, and the main clutch, we shall have more to say presently, but in Figs. 1 and 2 it may be noted that a long propeller-shaft, A, with universal joints at both ends, connects the clutch with the change-speed-gear; that the two brake-drums, B, are fixed to the differential countershaft, C; that the sprocket-wheels, C^1, have large hubs to accommodate the "spring-drive" devices inside them; that the countershaft brakes are operated by long pivoted levers, B^1, and by compensated diagonal rods, B^2, from the brake-pedal, B^3; that the internal expanding hub-brakes, D, are similarly actuated through the compensated rods, D^1, from the brake-lever, D^2; that the clutch-pedal, E, controls the clutch by means of two eccentrics, E^1; that the clutch is prevented from engaging too fiercely by the dash-pot, E^2; that the change-speed-lever, F, is arranged on the well-known "Mercedes" "gate" principle in conjunction with the three operating rods, F^1, F^2, and F^3; that the single lever, G (which controls the engine), lies immediately beneath the steering wheel; that the radiator H, occupies the usual position in front of the bonnet; and that the 20-gallon petrol tank, I, is placed beneath the driver's seat.

(*To be continued.*)

* * * *

Road Improvement in Scotland.

EVERYTHING connected with road improvement is of high interest to automobilists. Scotland has always had a good name for general progressiveness, and while a lot of fuss has been made about the various methods of road construction and dust prevention in this country, the good people of Perth have been finding out, if not a better way than any that have been proposed here, at any rate one that would seem to be thoroughly satisfactory and apparently presents the advantages of cheapness. The method to which we refer might be described as half Tarmacing the roads. We are all familiar with the old methods of putting a layer of stones on the road, a layer of dirt on the top of the stones, and sometimes a steam roller on top of that, and the wretched results of mud in winter and clouds of dust in summer which ensue. Instead of this the Perthshire experimenters have made up the road surface with metal in the ordinary way, but instead of adding thereto the ordinary dirt have levelled and smoothed it with limestone chips which have been thoroughly tarred. This process, when the road has been completed, gives, it is said, an elastic surface quite free from dust in summer and mud in winter, while the labour involved in rigidly making up the road and the upkeep of the road when made are considerably diminished. In fact, it is said that making up the road in this way is practically little, if anything, dearer than by the ordinary old-fashioned methods. It is of interest to be able to add that the Surveyor appends to his report on the experiments the statement that he found motor car traffic, which is increasing year by year in the district, did, as far as he could perceive, little harm to the roads when they were in good order and free from pools of water.

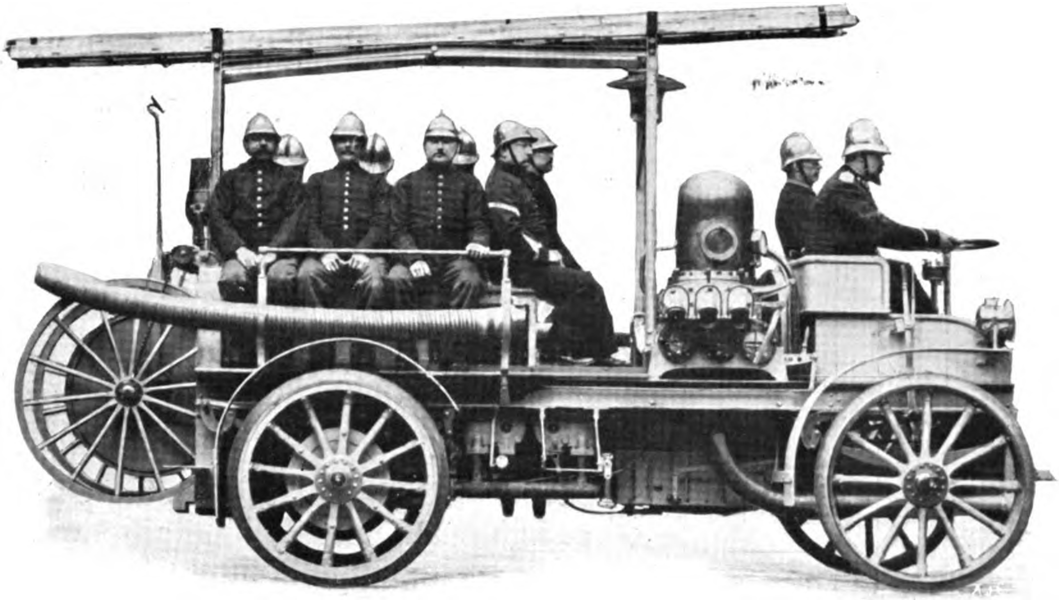
The Taxameter.

THE agitation for the introduction of the taxameter and sixpenny fares still emerges at times into the columns of the daily Press. Most people are convinced of its advantages, and are convinced that it would be a success; but the old-fashioned cab drivers will have none of it. We trust for the sake of their own prospects that the up-to-date motor cab drivers will adopt a more reasonable attitude.

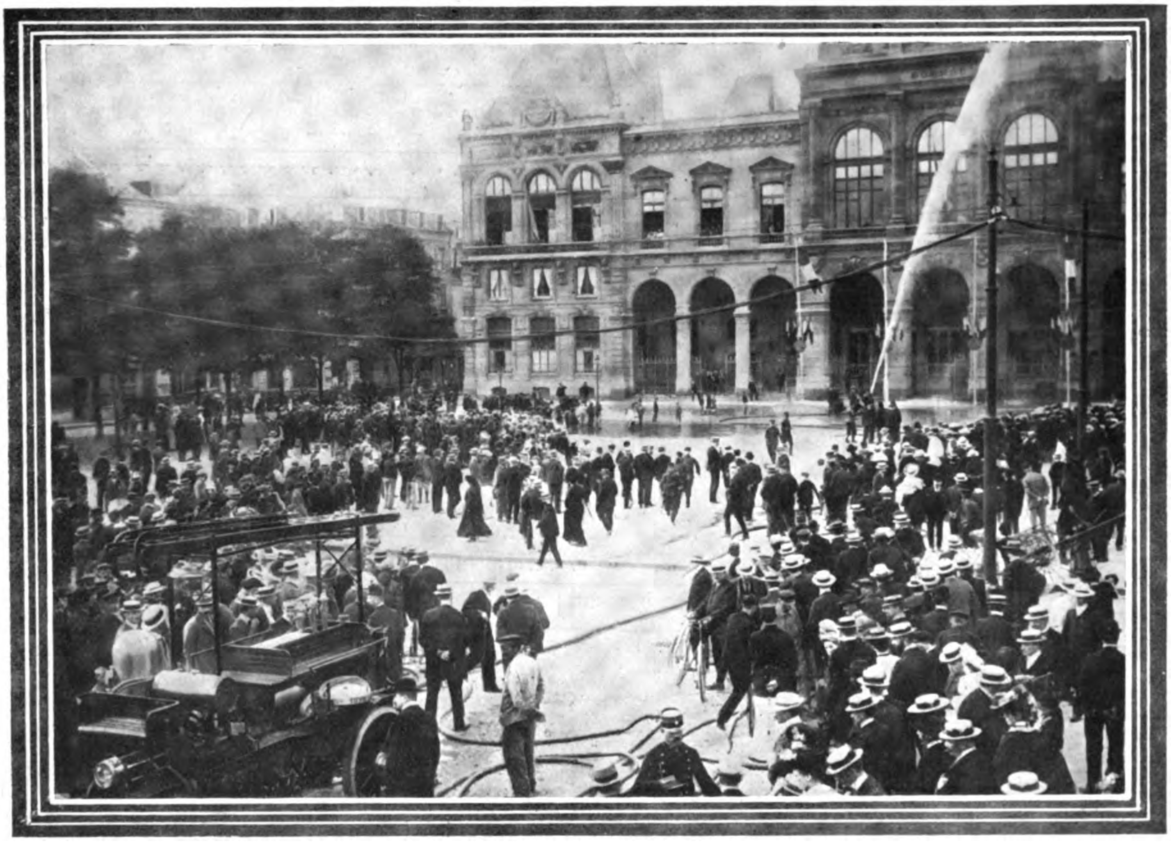
A Motor Boat Club for Glasgow.

OUR Glasgow correspondent sends us the following note:—"One of the funniest meetings at which I ever assisted was held in the secretary's office at the Glasgow Show last Saturday evening. A number of notices had been posted among the motor boat stands intimating that a meeting for the purpose of forming a motor boat club would be held, and about a dozen men, mostly in the trade, turned up. The chair was occupied by Mr. W. Scott Hayward, of Belfast, and Mr. Percy Lowcock, the agent for Gardner engines, acted as interim secretary.

There were not more than four Scotchmen present, and two of them spoke against the formation of a club other than one to be formed under the ægis of the Scottish Automobile Club, a view which was also supported by one or two of the Englishmen present. Ultimately, however, it was decided to form a branch of the British Motor Boat Club, and two or three names were given in. The curious part of the proceedings is, of course, the absurdity of a number of 'aliens' thinking that they can run a successful motor boat club in Scotland without the support of Scotsmen. The thing cannot be done."



A FRENCH PETROL FIRE ENGINE.—Quite a new type of fire engine has recently been acquired from Messrs. Thirion, pére et fils, of Paris, by the Havre authorities, this engine being equipped with a 4-cylinder petrol engine which both propels the machine from place to place and operates the pumps. As will be seen from the above illustration, this engine seats 10 men in all, besides carrying a winding drum holding 270 metres of hose, a further 180 metres beneath the back seats, an 8-metre extension ladder above, and a 1,500 litres canvas tank for the suction water. Solid rubber tyres are fitted to the road-wheels, and the change-speed-gear provides three forward speeds by means of gear-wheels which are at all times in mesh with one another.



THE HAVRE PETROL FIRE ENGINE.—After running from Paris to Havre at an average speed of 20 kiloms. (12½ miles) per hour—attaining a speed of about 34 kiloms. per hour on the level stretches—a public demonstration was given with this new fire engine, when it proved itself capable of throwing a steady stream of water upon the roof of the Bourse du Commerce, a height of over 60 metres. Our illustration shows the animated scene during the time that the various tests were in progress. The maximum capacity of the pumps was found to be 2,260 litres per minute, although nominally the delivery on each of the three speeds is supposed to be as follows: on the 1st speed (6 kiloms. per hour), 600 litres; on the 2nd speed (14 kiloms. per hour), 1,270 litres; and on the 3rd speed (22 kiloms. per hour at an engine speed of 800 revs. per min.), 2,000 litres per min.

BUYERS' GUIDE TO THE COMMERCIAL MOTOR VEHICLES (PETROL AND STEAM) OF 1906, ARRANGED IN ORDER OF PRICE. (Copyright Registered.)

NOTE.—In certain cases the information available is so meagre that we have not felt justified in including such vehicles in this table.

Buyers will find general particulars, enabling them to form a good all-round impression of each vehicle—such as price, capacity, &c.—in the left-hand columns, under the heading, "Leading Characteristics." Other useful data are included under "Constructional Details" in order to assist purchasers to obtain more minute information. Cars have been classified, primarily, as "petrol" and "steam," the former being sub-divided into heavy and light, and they have been further arranged, in each category, in order of price.

LEADING CHARACTERISTICS.								CONSTRUCTIONAL DETAILS.																
						Price.		Engine.					Transmission.			Wheels, Tyres, and Dimensions.					Driving Tyres.		Weight.	
Description.	Maximum Load.	Capacity (cu. ft.) or seats.	Platform Area.	Drive.	Axle.	Chassis.	Complete with Standard Body.	Type.	Number of Cyls.	Bore.	Stroke.	Normal Speed.	Clutch.	Change Speed.	Number of Speeds.	Wheels.	Wheel Base.	Track.	Overall Length.	Extreme Width.	Type.	Size.	Chassis.	Complete.
Petrol Vehicles for loads exceeding 30 cwt.																								
h.p.	tons		sq. ft.			£	£										ft. in.	ft. in.	ft. in.	ft. in.			tons	tons
24–30 Clement Talbot 'Bus	—	34	62	CC	*sa*	*825*	—	V	4	100	140	1000	*md*	S	4	W	11 7	5 4	21 0	6 4	R	1005 × 200 *t*	—	—
33 **Iris 'Bus**	—	34	—	Sw	*la*	*800*	950	V	4	4¾	4¾	1000	*md*	S	4	W.S	11 0	5 8	20 0	7 0	R	32 × 4 *t*	2¾	4
30-40 **Maudslay 'Bus**	—	34	—	CC	*sa*	*775*	900	V	4	5	5	750	*lc*	S	4	W	12 0	5 6	21 6	7 1½	R	38 × 5 *t*	3	4
25 Stirling Lurry	4	—	60	S	*la*	*775*	790	V	4	4¼	5¼	750	*ex*	S	3	W	10 6	5 6	16 0	7 3	S	× 10	3	—
24-30 **De Dion 'Bus or Lurry**	5	34	32	S	*la*	*750*	950	V	4	104	130	1350	*sd*	S	4	W	14 0	5 6	22 0	6 8	R	—	2½	3¾
24-30 **New Arrol-Johnston 'Bus** ...	—	34	—	CC	*sa*	*750*	900	V	4	4¼	5	950	*md*	S	4	W	12 0	5 4	20 6	6 6	R	40 × 4 *t*	2	—
24 **Thornycroft 'Bus**	—	34	50	CC	*sa*	*750*	900	V	4	4¼	5	1000	*md*	S	4	W	13 4	6 4	18 6¾	7 5⅜	R	40 × 3 *t*	2½	3¾
45 Fiat 'Bus	—	34	—	CC	*sa*	*750*	900	V	4	125	150	800	*md*	S	4	S	10 3	5 5	20 0	—	R	39 × 4 *t*	—	—
25 Stirling 'Bus	—	34	—	S	*la*	*725*	850	V	4	4¼	5¼	750	*ex*	S	3	W,S	10 9	5 6	18 0	7 4	R	36 × 4 *t*	2¾	4¼
24–30 Clement Talbot 'Bus or Lurry ...	15	10	34	CC	*sa*	*725*	—	V	4	100	140	1000	*md*	S	4	W	11 2	4 7	16 0	5 5	P	920 × 120	—	—
40 Ryknield 'Bus	—	34	—	—	—	*720*	920	V	4	5⅛	6	1000	*lc*	S	4	W	13 6	5 6¾	19 10	6 9	R	32	2¾	4¼
30 Dennis	—	34	—	Sw	*la*	*720*	850	V	4	4⅛	5⅜	900	*lc*	S	3	W	12 8	5 6	21 6	6 8	R	36 × 4	2¼	3¼
28–36 Mors 'Bus	—	34	—	CC	*sa*	*720*	830	V	4	110	150	1000	*mc*	S	3	W	13 0	5 8	18 6	6 8	R	—	3	4
33 **Iris Lurry**	5	—	101	Sw	*la*	*720*	760	V	4	4¾	4¾	1000	*md*	S	4	W.S	11 0	5 8	20 0	7 0	S	32	2¾	3¼
36-40 **Straker-McConnell 'Bus**	—	34	—	S	*la*	*700*	—	V	4	120	140	1200	*lc*	S	4	W	13 10	4 11	22 0	6 4½	R	950 × 100 *t*	3½	—
30 Saurer 'Bus	—	34	—	CC	*sa*	*700*	900	V	4	120	150	800	*lc*	S	4	W	12 6	5 8	18 8	6 8	R	40	2¼	3½
30 Ducommon 'Bus	—	34	—	S	*la*	*700*	900	V	4	110	140	1000	*lc*	S	4	W	14 0	5 8	19 0	6 8	R	36	2½	3½
32 Durkopp 'Bus	—	34	—	CC	*sa*	*700*	900	V	4	110	135	1000	*lc*	S	4	W	14 0	5 8	17 9	6 10	R	36	2¾	3¾
30 Wolseley 'Bus or Lurry	3	34	—	CC	*sa*	*700*	—	V	4	4½	5	900	*lc*	S	4	W	12 0	6 2	16 10	7 2	—	40 × 4 *t*	2¾	—
30 Dennis Lurry	3½	—	58	Sw	*la*	*700*	800	V	4	4⅛	5⅜	900	*lc*	S	3	W	11 6	5 6	17 0	7 0	S	34 × 8	2¼	3
30–35 "W" type 'Bus	—	34	—	CC	*sa*	*680*	880	V	4	120	150	900	*lc*	S	4	W	12 0	5 9	18 0	6 10	R	36	2¾	3¾
20-30 **Maudslay 'Bus**	—	22	—	CC	*sa*	*675*	775	V	4	4½	4	850	*lc*	S	4	W	12 0	5 0	20 3	5 10	R	× 5 *t*	1½	2¼
30 Stirling 'Bus	—	34	—	CC	*sa*	*675*	—	V	4	4¼	5¼	1000	*ex*	S	4	W,S	12 6	5 8	20 0	7 4	R	36 × 4 *t*	2½	4
24 **Thornycroft Van**	2	—	40	CC	*sa*	*670*	720	V	4	4¼	5	1000	*md*	S	3	W	10 10	5 2	15 5	5 10	R	34 × 3½ *t*	1¾	2¼
24 Brillie 'Bus	—	34	—	CC	*sa*	*650*	900	V	4	100	120	1200	—	—	3	W	9 2	—	15 6	6 0	R	—	2¼	3¼
24 Straker-Squire 'Bus	—	34	—	CC	*sa*	*650*	900	V	4	105	130	900	*lc*	S	4	W	13 6	5 8	20 0	7 0	R	—	2¾	4
35-40 **Critchley-Norris 'Bus**	—	34	—	CC	*sa*	*650*	—	V	4	4¾	6	800	*lc*	S	4	S	12 7	5 9	19 3	6 10	R	36 × 5 *t*	—	—
30 Dennis Van	2	340	60	Sw	*la*	*650*	700	V	4	4	5⅓	900	*lc*	S	3	W	11 6	5 6	16 0	6 3	R	34 × 4 *t*	2	2½
35 Crossley-Leyland...	—	34	—	S	*la*	*640*	900	V	4	4¾	5½	750	*mc*	S	3	W	13 3	—	22 9	7 0	R	39 × 5 *t*	—	—
28–35 Simms-Welbeck 'Bus	—	34	—	CC	*sa*	*625*	875	V	4	120	135	800	*md*	U	3	W	13 0	5 10	18 11	7 5½	R	36 × 4 *t*	—	—
24–30 Thames Eng. Co. 'Bus	—	34	—	CC	*sa*	*625*	—	V	4	105	140	1000	*lc*	S	3	W	13 0	6 4	—	—	R	42 × 4 *t*	2¾	—
25-30 **Critchley-Norris 'Bus**	—	34	—	CC	*sa*	*600*	—	V	4	4¼	5⅛	800	*lc*	S	4	S	12 7	5 9	19 3	6 10	R	36 × 5 *t*	—	—
25–30 James and Browne 'Bus	—	34	—	CC	*sa*	*600*	860	H	4	4½	6	700	*mc*	S	4	W	10 0	6 2	18 8	7 2	R	34 × 5	1¾	3
20-30 **Maudslay Van**	1¾	—	26½	CC	*sa*	*600*	660	V	4	4½	4	850	*lc*	S	4	W	—	—	—	—	R	× 5	1½	1¾
45 Jackson 'Bus	—	34	—	CC	*sa*	*580*	—	V	4	140	160	750	*lc*	S	3	W	12 6	5 6	19 0	6 6	R	× 4 *t*	—	—

LEADING CHARACTERISTICS.								CONSTRUCTIONAL DETAILS.																
						Price.		Engine.					Transmission.			Wheels, Tyres, and Dimensions.							Weight.	
																					Driving Tyres.			
Description.	Maximum Load.	Capacity (cu. ft.) or seats.	Platform Area.	Drive.	Axle.	Chassis.	Complete with Standard Body.	Type.	Number of Cyls.	Bore.	Stroke.	Normal Speed.	Clutch.	Change Speed.	Number of Speeds.	Wheels.	Wheel Base.	Track.	Overall Length.	Extreme Width.	Type.	Size.	Chassis.	Complete.
Petrol Vehicles for loads exceeding 30 cwt.—*continued.*																								
h.p.	tons		sq. ft.			£	£										ft. in.	ft. in.	ft. in.	ft. in.			tons	tons
17–23 Mors 'Bus or Van	—	15	—	CC	*sa*	*570*	670	V	4	90	125	1000	*mc*	S	4	W	—	4 9	—	—	R	—	—	—
15 **De Dion Lurry**	3	—	60	S	*la*	*570*	—	V	2	110	130	1350	*sd*	S	3	W	11 3	4 10	16 6	6 2	R	—	—	2¼
24 **Straker-McConnell 'Bus**	—	34	—	S	*la*	*560*	—	V	2	150	180	900	*lc*	S	4	W	13 0	4 11	18 10	6 4½	R	952×100 *t*	3	—
12 Stirling 'Bus	—	16	9	S	*la*	*540*	650	V	2	4⅝	5½	750	*ex*	S	3	W	10 6	5 4	16 6	7 4	R	×2¾ *t*	1¾	2¼
15 **De Dion 'Bus**	—	14	—	S	*la*	*510*	—	V	2	110	130	1350	*sd*	S	3	W	10 6	4 8	19 0	6 3	R	—	—	2¼
12 **De Dion Lurry**	2	—	48	S	*la*	*505*	—	V	2	100	110	1350	*sd*	S	3	W	8 3	4 8	12 6	5 10	R	—	—	1¾
14 Stirling Lurry	2	—	44	S	*la*	*500*	—	V	2	4⅝	5½	750	*ex*	S	3	W	10 0	5 0	13 6	7 2	S	×6	1¾	2
12 **De Dion 'Bus**	—	10	—	S	*la*	*460*	—	V	2	100	110	1400	*sd*	S	3	W	9 6	4 8	14 6	5 10	R	—	—	1¾
20 Thames Eng. Co. Van	2	215	32	CC	*sa*	*410*	450	V	2	160	160	1000	*lc*	S	3	W	8 6	5 0	15 6	6 0	R	32×2½ *t*	—	1½
14 Thames Eng. Co. Van	1¾	200	30	CC	*sa*	*370*	400	V	2	105	140	1200	*lc*	S	3	W	8 0	6 0	14 6	6 0	R	32×3	—	1¼
24 **De Dietrich 'Bus**	—	34	—	CC	*sa*	—	—	V	4	120	120	800	*lc*	S	4	W	12 6	5 3	22 4	6 9	R	950×100 *t*	—	—
25 Milnes-Daimler 'Bus	—	34	—	G	*sa*	—	—	V	4	110	140	800	*lc*	S	4	W	13 0	5 1	22 6	6 9	R	40×4 *t*	2½	3¾
24–30 Beaufort 'Bus...	—	34	—	CC	*sa*	—	—	V	4	100	135	—	*lc*	S	4	W	14 9	6 6	20 0	—	R	36×4 *t*	—	—
30 "British" 'Bus	—	34	—	S	*la*	—	—	V	4	5	6	800	*lc*	S	3	W	12 0	6 0	20 0	7 0	R	36×4 *t*	3¼	4½
30 "British" 'Bus	—	16	—	S	*la*	—	—	V	4	4	5	800	*lc*	S	3	W	12 0	6 0	17 6	7 0	R	36×4 *t*	1¼	2½
24 Churchill Char-a-banc	—	27	—	CC	*sa*	—	—	V	4	105	140	1200	*mc*	U	3	W	—	—	—	—	R	40×5	—	—
Petrol Vehicles for loads not exceeding 30 cwt.																								
24 **Iris Van**	30	135	30	CC	*sa*	*600*	660	V	4	4¾	4¾	800	*lc*	S	4	W	9 0	4 6	14 0	6 0	P	915×105	21	27
12–15 Clement Talbot Lurry	30	—	46	G	*sa*	*585*	—	V	2	100	140	1000	*md*	S	3	W	12 4	4 11	19 8	5 9	R	805×200	—	—
16–20 **Maudslay Van**	15	—	16	CC	*sa*	*525*	575	V	3	4½	4	850	*lc*	S	3	W	—	—	—	—	R	×3½	16	20
12–15 Clement Talbot Van...	15	—	40	G	*sa*	*465*	—	V	2	100	140	1000	*md*	S	4	W	12 5	4 7	18 0	5 3	P	820×120	—	—
10 **De Dion Lurry**	30	—	48	S	*la*	*460*	—	V	2	90	110	1350	*sd*	S	3	W	8 3	4 8	12 6	5 10	R	—	—	1¾
16 Dennis Van	30	230	44	Sw	*la*	*450*	500	V	2	4⅛	5¾	900	*lc*	S	3	W	10 0	5 0	15 0	6 0	R	34×4	30	38
14–16 James & Browne Ambulance Wagon	—	176	32	CC	*sa*	*440*	560	H	4	3½	4½	800	*mc*	S	4	W	8 5	4 1½	13 6	5 0	P	875×105	18	24
16 James and Browne Van	15	135	27	CC	*sa*	*440*	520	H	4	3½	4½	800	*mc*	S	4	W	8 0	4 1½	11 9	5 0	R	34×3	18	23
10 **De Dion 'Bus**	—	8	—	S	*la*	*435*	—	V	2	90	110	1400	*sd*	S	3	W	9 6	4 8	14 6	5 10	R	—	—	34
14 James and Browne Van	30	240	40	CC	*sa*	*380*	482	H	2	4½	6	700	*mc*	S	4	W	9 0	5 0	12 4	6 0	R	34×2½ *t*	20	28
12–15 **New Arrol-Johnston Van**... ...	30	—	—	CC	*sa*	—	430	H	2	4¼	6½	800	*lc*	S	4	W	10 6	4 10	12 2	5 9	R	—	30	35
16 Singer Van	—	90	30	C	*la*	*375*	425	H	2	4	6	800	*mc*	S	3	W	7 0	4 3	10 5	5 0	R	32×3½	16	18
12 Crawshay-Williams	17	200	—	CC	*sa*	*350*	—	V	2	95	120	900	*md*	S	3	W	7 6	4 6	11 6	5 6	R	×3	18	—
12–14 Simms-Welbeck Van	20	—	—	S	*la*	*350*	410	V	2	110	110	800	*lc*	U	3	W	9 2	—	12 5	5 6	R	30	—	—
12–14 Beaufort Lurry	30	—	—	CC	*sa*	—	400	V	2	100	135	1000	*lc*	S	3	W	9 2	4 6	16 0	5 7	R	30×3½	—	—
16 Lacre Van...	15	—	—	C	*la*	*340*	380	V	2	4⅛	5	900	*lc*	U	3	W	7 10	4 6	—	6 0	R	34	18	24
12 Thames Eng. Co. Van	25	—	24	CC	*sa*	*330*	360	V	2	95	130	1200	*lc*	S	3	W	7 3	4 8	10 6	5 6	R	30×3	—	—
12 Metropolitan Mail Van	15	120	28	CC	*sa*	*325*	365	V	2	4	4	1200	*lc*	S	4	W	9 6	4 8	13 0	5 6	R	32×3½	25	30
10–12 **Argyll Van**	14	80	—	S	*la*	—	350	V	2	95	140	1100	*lc*	U	3	W	9 0	4 1¼	13 3	5 3	R	—	17	18
14 James and Browne Van	15	64	16	CC	*sa*	*320*	390	H	2	4½	6	700	*mc*	S	4	W	8 5	4 1½	11 6	5 0	R	34×3	15	18
10–12 Clement Talbot Van..	15	60	20	S	*la*	*295*	340	V	2	100	120	1100	*lc*	S	4	W	9 1	4 5	—	5 4½	P	810×90	13	17
10 Thames Eng. Co. Van	15	145	21	CC	*sa*	*295*	320	V	2	88	140	1200	*lc*	S	3	W	7 3	4 5	12 9	5 6	R	30×2½	—	19
14–16 **Straker-McConnell Van**	30	—	—	CC	*sa*	*275*	—	V	2	100	120	1200	*lc*	S	3	W	7 8	4 1½	11 2	5 2½	R	810	15	—
14 Churchill Van	10	—	—	S	*la*	*270*	—	V	2	105	140	1200	*mc*	U	3	W	—	—	—	—	R	32×2½	—	—
9 **De Dion Van**	—	—	—	S	*la*	*248*	—	V	1	110	130	1400	*sd*	S	3	W	8 9	3 10	11 10	4 11	R	30	8	—
10 Alldays Van	10	52½	10½	CC	*sa*	*210*	242	V	2	3¾	4½	1400	*lc*	S	3	W	6 6	3 10	10 0	4 6	R	28	10½	12½
8 **De Dion Van**	10	—	—	S	*la*	*185*	—	V	1	100	120	1600	*sd*	S	3	W	6 2	3 9	8 11	4 8	P	28	11	—
10 Alldays Van	5	52½	10½	S	*la*	*200*	231	V	2	3⅜	4½	1400	*lc*	S	3	W	6 6	3 10	10 0	4 6	R	28	10	12
6 Wolseley Van	2	—	—	C	*la*	*160*	185	H	1	4½	5	800	*lc*	S	3	W	5 6	4 0	8 6	4 6	P	28×3¼	8½	10

STEAM VEHICLES.

LEADING CHARACTERISTICS.						PRICE.		CONSTRUCTIONAL DETAILS. ENGINE.					BOILER.							DRIVING TYRES.		WEIGHT.	
Description.	Maximum Load.	Capacity (cu. ft.) or seats.	Platform Area.	Drive.	Fuel.	Chassis.	Complete with Standard Body.	Type.	Simple or Compound.	Number of Cyls.	Bore.	Stroke.	Type.	Heating Surface.	Wheels.	Wheel Base.	Track.	Overall Length.	Extreme Width.	Type.	Size.	Chassis.	Complete.
h.p.	tons		sq. ft.			£	£				ins.	ins.		sq. ft.		ft. in.	ft. in.	ft. in.	ft. in.			tons	tons
60 Straker Wagon	7	—	64	C	*co*	*800*	850	H	C	2	4½ and 8	9	*water*	70	S	12 3	6 4	21 6	7 6	S	50 × 14	8	8½
60 St. Pancras Wagon	7	—	91	CC	*co*	*670*	700	H	C	2	5 and 8	7½	*water*	140	S	12 0	6 5	18 0	7 6	S	60 × 14	7	7¼
35 Thames Eng. Co. Lurry	6	—	80	G	*co*	*650*	675	H	C	2	4 and 7	7	*fire*	68	S	10 6	6 0	20 0	6 9	S	38 × 10½	4½	5
32 Chelmsford 'Bus	—	34	—	CC	*pa*	*625*	890	H	S	2	4	4	*flash*	140	W	11 0	5 9	17 4	7 4	R	40 × 4*t*	3	4
— Mann Lurry	7	—	98	G	*co*	—	600	H	C	2	5 and 8	8	*loco.*	—	S	14 1½	6 1	15 0	7 0	S	45 × 12	—	7½
35 Lancashire Tip Wagon	5	—	60	CC	*co*	*540*	595	H	C	2	4 and 7½	6	*fire*	75	S,W	9 0	—	17 3	6 6	S	36 × 8	4¾	—
50 Sentinel Wagon	6	500	83	C	*co*	*540*	560	H	S	2	6¾	10	*water*	62	S,W	9 0	4 9	18 4	5 7½	S	40 × 10¼	4¾	5
45 Straker Wagon	5	—	72	C	*co*	*530*	560	H	C	2	4 and 7	7	*loco.*	58	S	12 8	5 2	20 0	—	S	42 × 10	4½	5
30 Jesse Ellis Wagon	5	—	58	G	*co*	—	550	H	C	2	4 and 8	6	*fire*	65	W	10 5	6 6	16 8	6 8	W	42 × 10	4½	5
40 St. Pancras Wagon	5	—	84	CC	*co*	*518*	530	H	C	2	4½ and 7	6	*water*	90	S	10 0	6 3	18 0	7 1	S	39 × 10½	4½	5
35 Yorkshire Lurry	5	—	85	G	*co*	*465*	480	H	C	2	4½ and 7½	7½	*loco.*	56	S,W	10 9	—	18 6	6 1	S	39 × 10½	4¼	4¾
— Mann Lurry	5	—	77	G	*co*	—	475	H	C	2	4¼ and 6¾	7	*loco.*	—	S	10 4	5 0	18 6	6 4	S	42 × 10	—	5
25 Yorkshire Lurry	4	—	72	G	*co*	*435*	450	H	C	2	4 and 6½	7½	*loco.*	56	S,W	10 3	—	17 6	5 7½	S	39 × 8½	3½	4
— Mann Cart	5	100	40	G	*co*	—	450	H	C	2	4 and 6⅜	7	*loco.*	—	S	8 0	5 1½	14 4	6 2	S	48 × 10	—	5
25 Yorkshire Lurry	3	—	72	G	*co*	—	425	H	C	2	4 and 6½	7½	*loco.*	50	S,W	10 3	—	17 6	5 6	S	39 × 7½	3¼	3¾
20 Yorkshire Lurry	2	—	55	CC	*co*	*380*	400	H	C	2	3¾ and 6	6	*loco.*	50	S,W	9 0	—	15 6	4 9½	S	39 × 6	2½	3
— Mann Lurry	2	—	55	G	*co*	—	375	H	C	2	3¾ and 6⅜	6	*loco.*	—	S	9 2	5 1	15 6	5 6	S	39 × 6½	—	3
50 Hay Lurry	6	—	132	R	*co*	—	—	H	C	2	6 and 14	12	*water*	100	W	11 6	6 3	23 6	7 6	W	42 × 11½	4¾	5
30 Coulthard Lurry	6	—	91	CC	*co*	—	—	H	C	2	4 and 7	6	*fire*	107	W	10 10½	6 6	19 6	6 8	S	36 × 11	4¾	5
45 Bretherton Lurry...	5	—	82	G	*co*	—	—	H	C	2	5 and 7¾	9	*fire*	75	S,W	10 6	6 1	17 6	6 11½	S	42 × 10	4½	5
40 Carter Lurry	5	—	91	C	*co*	—	—	V	C	2	4 and 7	6	*fire*	91½	W	10 6	6 0	19 0	7 0	S	42 × 10	4	4¾
25 Robertson Wagon	5	—	87¾	CC	*co*	—	—	H	C	2	4 and 7	5	*fire*	80	W,S	9 0	6 0	18 9	7 2	S	39 × 10½	—	4¾
25-30 Thames Eng. Co. Lurry	4	—	85	G	*co*	—	—	H	C	2	3⅞ and 6½	6	*loco.*	50	S	10 3	5 10	19 6	6 9	S	38 × [illegible]	3½	4
20 Carter Wagon	3	—	60	CC	*co*	—	—	V	C	2	3 and 6	5	*water*	90	W	9 0	4 0	15 0	5 6	R	36 × 6	—	3
— Hercules Lurry	5	—	—	CC	*co*	—	—	H	C	2	—	—	*fire*	—	S,W	—	—	—	—	S	—	—	—
— Londonderry Lurry	5	—	78	G	*co*	—	—	H	C	2	4¼ and 7	6	*fire*	95	—	—	—	—	—	S	39 × 10	—	—
30 Thornycroft Lurry	4	—	—	G	*co*	—	—	H	C	2	4 and 7	5	*water*	—	S	—	—	—	—	S	—	—	—
45 Thornycroft Lurry	5	—	94½	G	*co*	—	—	H	C	2	4½ and 7	7	*loco.*	57	S	11 5	5 7½	—	—	S	—	—	—
— Hindley Lurry	2½	—	60	C	*co*	—	—	V	C	2	—	—	*loco.*	—	—	—	—	—	—	S	—	—	—
30 Savage Lurry	5	—	75	CC	*co*	—	—	H	C	2	4 and 7	5	*water*	94	S	—	—	—	—	S	39 × 7	—	—
Steam Tractors.																							
— Aveling and Porter Tractor	—	—	—	G	*co*	—	525	H	C	2	4¼ and 6⅛	8	*loco.*	63·4	S	7 11½	—	13 10½	5 6	S	54 × 12	—	5
— Mann Tractor	5†	—	33	G	*co*	—	425	H	C	2	4 and 6⅜	7	*loco.*	—	S	8 0	5 0	12 0	6 0	S	48 × 10	—	4¾

† 2 tons on tractor, 3 on trailer.

Leading Characteristics—
Drive.—S = Shaft; CC = Side Chains; C = Single Chain; G = Gear; R = Ratchet.
Live-Axle.—*la* = Live-axle; *sa* = Stationary-axle.
Fuel.—*Co* = Coal or Coke; *Pa* = Paraffin.

Engine—
Type.—H = Horizontal; V = Vertical.

Simple or Compound.—C = Compound; S = Simple.

Boiler—
Type.—*Loco* = Locomotive type; *Fire* = Fire-tube type; *Water* = Water-tube type.

Transmission—
Clutch.—*lc* = Leather Faced Cone; *mc* = Metal Cone; *md* = Multiple Disc; *sd* = Single Disc; *ex* = Expanding.

Change Speed Gear.—S = Sliding Spur; U = Unusual.

Wheels—
W = Wood; S = Steel.

Tyres—
S = Steel; R = Solid Rubber; P = Pneumatic; W = Wood; *t* = twin tyres.

HYDRAULIC CLUTCHES—THE SPARKS-BOOTHBY CLUTCH.

(*Concluded from page* 315.)

Also mounted on the same shaft is the "inner member," B^1. This is a simple dish-shaped casting with conical sides, but it is larger in diameter than the other conical casting, A^3, which it surrounds, and thus a clearance-space is left between them to form the pump-chamber, C. Fixed inside, against the conical wall of this casting, is the stop, B^2, and on either side of this are the open port, B^3, and the grid-valve, B^4, respectively. A larger view of the grid-valve, B^4, is given in Fig. 2, and this also shows the lever, B^6, by which it is operated from the clutch-shaft, B.

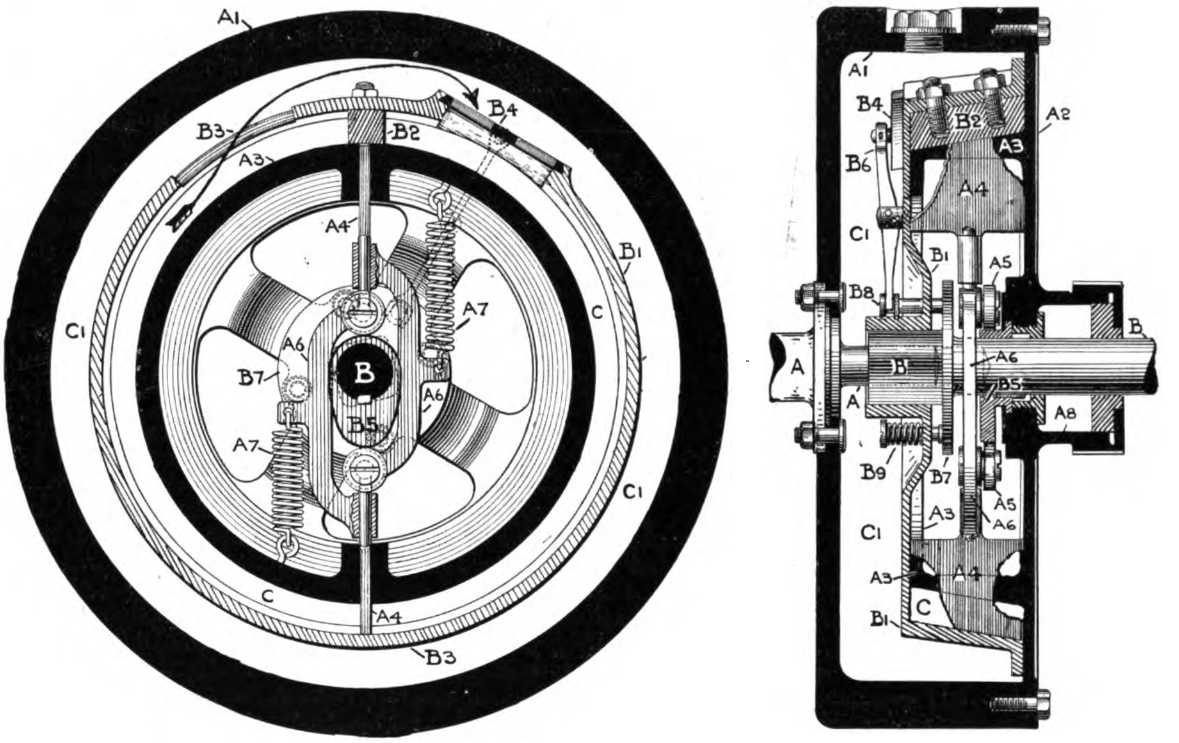


Fig. 3.—The Sparks-Boothby Clutch. Sectional drawings showing the internal construction. In both views the main portions of the engine-driven member, which include the fly-wheel, are shown in solid black.

Referring to the sectional drawing in Fig. 3, it will be noticed that the shaft, B, has a large flange, B^7, from which project pins, B^8 and B^9. Of these, the pin, B^8, forms the connection between the shaft and the lever, B^6, but the others, B^9, each carry light helical springs. These

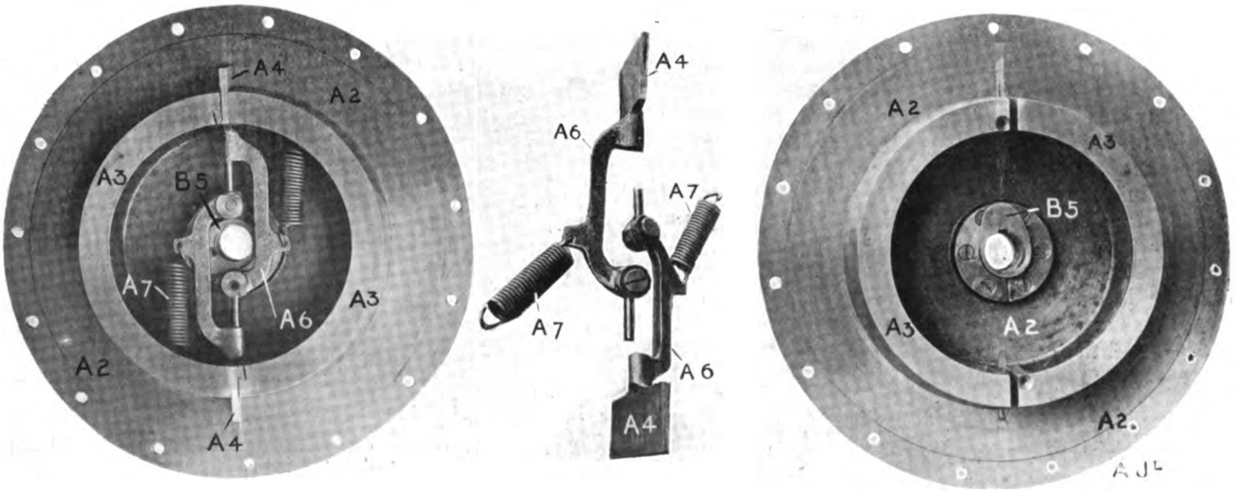


Fig. 4.—The Sparks-Boothby Clutch. Views of the main engine-driven member, A^2, which is fixed to the fly-wheel. In the left-hand illustration the paddles, A^4, by which the drive is transmitted through the medium of oil, are shown in place. In the centre, these paddles are shown separately on a larger scale, and on the right is another view of the casting, A^2, to indicate the position of the cam, B^5, which is attached to the clutch-driven shaft and operates the paddles.

springs always tend to draw the clutch-shaft, B, inwards, thus disengaging the clutch, but the action is neutralised by a much stronger external spring, which thus leaves them at all times free to maintain a light pressure on the back of the member, B¹. It will be understood that the satisfactory action of the clutch depends on being able

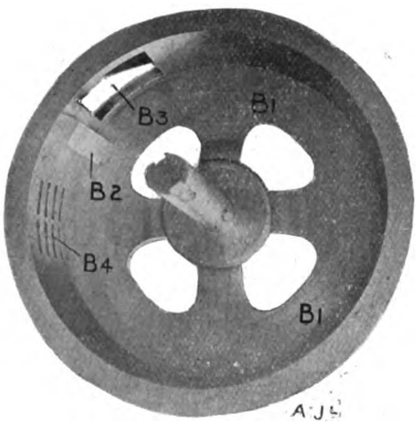


Fig. 5.—The Sparks-Boothby Clutch. View of the casting, B¹, which forms the clutch-driven member. In this illustration the position of the ports, B³ and B⁴, relatively to the stop, B² is clearly indicated.

to ensure an oil-tight contact, except when the clutch is quite free, between the flanges on the cones, A³ and B¹, and the flat faces against which they respectively press. When the clutch is slipping, these surfaces rub over each other, but still maintain virtually oil-tight joints. If these joints are broken, the pump-chamber—considered as an oil-tight vessel—ceases to exist, with the consequence that the clutch is entirely disengaged. With the force of the oil behind it, however, there is, of course, no difficulty in ensuring a good joint with reasonably accurate surfaces, but when the clutch is just being brought into engagement, it is desirable that there should already be sufficient pressure to squeeze out the oil from between these surfaces, in order to enable them to make their initial contact. It is for this purpose that the springs, B⁹, are provided. When the clutch-shaft, B, has been thrust inwards a certain distance, the flange, B⁷, comes in contact with the casting, B¹, and if the motion of the pedal be continued, it will force the two members, B¹ and A², apart, thus allowing them to run absolutely free. This latter action is not only provided in order to facilitate gear-changing, but also to avoid any tendency for the clutch to become overheated—an effect which would be introduced were the oil to be circulated for indefinite periods while the engine is running light.

In the other type of clutch, also on the market, the principle is exactly the same as with the model dealt with in this article, except that the valve is of the butterfly type, and that the castings are of a slightly different shape.

Some Early Difficulties in Design.

It is interesting to notice some of the original difficulties which presented themselves in the design of this clutch, because they explain the why and wherefore of various details in the arrangement. At first sight, for instance, it was thought that only one paddle, A, would be necessary, but one of the first drawbacks to the use of only one vane was the necessity for preventing it from striking the stop, B², when it had dispersed all the intervening oil between them. This was ingeniously overcome by mounting the paddle so that it could be actuated by a cam in the manner described, and although this arrangement overcame the initial difficulty, it immediately introduced another trouble on account of the fact that, while the paddle is passing under the stop it is no longer pressing upon the oil, and the load is therefore taken off the engine, which naturally tends to race. In order to neutralise this, two paddles were, therefore, provided—opposite one another—so that there would always be one in action. Many of the difficulties of making a clutch of this type work satisfactorily were by no means apparent during the preliminary stages of its design, and some of those met with by Mr. Sparks, who has devoted so much time to his invention, are both interesting and instructive.

One incident during the early experiments occurred with somewhat dramatic suddenness, for just as the first experimental clutch—which was of a somewhat different type—was about to be brought into engagement for the first time, it suddenly obtained a firm hold, and neither persuasion nor force was of the slightest avail in releasing it. This was hardly an encouraging beginning for an inventor engaged in the construction of a clutch in which the chief characteristic should be its pronounced softness, and capacity for slipping. In this original clutch, however, there was no valve corresponding to that in the present model, as it was at that time intended to rely upon the gradual separation of the two principal members—which were held together by the oil pressure, as they are now—to provide the required slip. Unfortunately, however, the actual values of these pressures had been under-estimated, and the result was that the force exerted by the engine on the small paddle became multiplied over the large surface of the inner clutch member by the oil. This pressure amounted to far more than any ordinary man could possibly overcome with the leverage available, so that the clutch, once engaged, was virtually stuck fast until the engine had been stopped, and the source of pressure thereby removed.

Table of Reference Letters for the Sparks-Boothby Hydraulic Clutch.

A	Driving shaft.
A¹	Fly-wheel.
A²	Face plate.
A³	Cone on A².
A⁴	Paddles
A⁵	Rollers on A⁴.
A⁶	Stays for A⁴.
A⁷	Springs for A⁴.
A⁸	Stuffing-box.
B	Driven shaft.
B¹	Inner clutch member on B.
B²	Stop on B¹.
B³	Open port.
B⁴	Grid-valve.
B⁵	Cam operating A⁵.
B⁶	Lever operating B⁴.
B⁷	Flange attached to B.
B⁸	Pin connecting B⁷ and B⁶.
B⁹	Supplementary clutch springs.
C	Oil space forming pump-chamber.

⊛ ⊛ ⊛ ⊛

Australian State Motor Car Service.

To those whom the name of the great Polish patriot has associations almost of a sacred character, the information that a motor car has been "up Kosciusko" will come as something of a shock. Kosciusko, however, is in the present instance a mountain in the southern Alps of Australia, and up it a service of motor cars is now being organised. The Colonial Government is elaborating a scheme for developing the tourist centres of New South Wales, and this scheme includes both a motor car service up the mountain, and to the Genolan Caves.

PNEUMATIC TYRES FOR MOTOR VEHICLES.

THEIR SELECTION, MANAGEMENT, REPAIR, AND MANUFACTURE.

By COLIN R. CROMBIE.—(*Concluded from page 331*).

The Manufacture of Tyres.

BEFORE dealing with the question of manufacture, I should, perhaps, say a few words concerning the preparation of the rubber which is to be used. Indiarubber is the latex which exudes like sap from certain rubber-bearing trees, and is procured by tapping trees of from eight to twelve years old and upwards, yielding from one to four pounds of rubber in the season. The rubber comes chiefly from South America and Africa, and Para rubber is now being cultivated with great success on the tea estates of Ceylon and the Straits Settlements. At present, the world consumes about 60,000 tons of rubber per annum, about 50 per cent. of which comes from Para. The best rubber, and that mostly used in the manufacture of pneumatic tyres, comes from the Amazon Valley, and is known as Para rubber—Para being the port from which it is shipped.

Crude Rubber.

On arrival at the factory, the rubber, which comes in blocks and slabs mixed with sand and vegetable matter, is cut up into small pieces and boiled in tanks, in order to assist in removing the impurities, which are sometimes considerable. I have seen what is irreverently known as "Missionary Ball," that is, a lump of clay covered with a skin of rubber, for which we have paid at the rate of 5*s*. 6*d*. per pound—evidence of the march of civilization among the native collectors.

Preliminary Treatment.

After having been boiled, the rubber is taken to the washing mills, where it is crushed into the form of a thin sheet between the corrugated surfaces of a pair of heavy rolls, a constant stream of water being played upon it so as to remove all the impurities and leave a clean sheet of partly-masticated rubber. These sheets are taken to the drying room and hung up to dry for from fourteen to twenty-one days in a temperature of about 10 to 100 degrees Fahrenheit. The rubber, after being dried, is ready for mixing with the vulcanizing and other compounds. Sulphur and litharge, or oxide of lead, are the principal vulcanizing agents employed, other ingredients being used to toughen the rubber or cheapen its quality. After being mixed in this way, the rubber, or "batch," as it is now called, is ready for calendering.

The Framework of a Tyre—the Canvas.

The first part of a tyre to be considered is the casing, which is mostly composed of cotton canvas. The cotton used is chiefly Sea Island, the next in strength being Egyptian, although some manufacturers prefer the Egyptian, as they consider it is slightly tougher and better able to stand the strain. All canvases are tested in a machine, and their breaking strain ascertained before being used on a tyre. The greatest care is required in the preparation of the canvas before it can be made into the casing. It is essential that it be bone dry, otherwise the rubber will not adhere to it. It must also be free from all size or other dressing, which would tend to weaken the fibres when exposed to the heat of vulcanization.

Impregnating with Rubber.

The web of canvas is then coated and impregnated with rubber, by a process known as friction calendering. The friction-calender used for this purpose consists of a massive framework, carrying three chilled iron rolls, which are heated by steam, the centre roll being driven at twice the speed of the other two. The rubber is fed in between the upper and centre rolls, and the canvas is passed between the centre and lower rolls. The rubber adheres in the form of a thin coating to the centre roll, owing to its higher speed and greater heat, and is thus driven by combined friction and pressure into the meshes of the canvas. The canvas is usually double-frictioned, that is to say, the rubber is applied first to one side and then to the other.

Building up the "Casing."

The canvas having thus been impregnated with rubber, is cut into strips diagonally across the piece, as nearly as possible at an angle of 45 degs., and varying in length and width according to the size of the tyre required. This is done, firstly, to enable the canvas to adapt itself to the double curve of the tyre, and, secondly, for the purpose of preventing the tyre from rolling, by having the short strands anchored on opposite sides with a direct resistance to side pull. With a straight-cut canvas there would be no such anchoring, and every strand would be free to move from side to side. The canvas has now to be stretched round on a form-block, and wrinkles which develop at the side have to be smoothed out. The number of piles of canvas employed on the casing depends on the size of tyre, but this will again be referred to later on.

The Importance of the "Bead."

The next operation is the making of the bead. Upon the regularity of the beads and their being spaced correctly—that is to say, placed at a uniform distance from each other throughout the circumference of the tyre—a good deal of the durability of the tyre, and certainly the power of staying on the rim when inflated to an enormous pressure, depends. I think I may fairly say it is at the bead that the largest number of tyres are found to be defective when it comes to having them re-treaded. This damage is sometimes caused by fitting wrong tyres to wrong rims, or by the sharp edges of rims, but most frequently by allowing water to lodge in the rim, the rust thereby formed getting at the canvas and rotting it. In a large number of cases, tyres which have been damaged in this way are quite beyond repair, as it is needless to re-tread a tyre if the canvas be insufficiently strong to carry the tread.

Avoid Rusty Rims.

In order to avoid this source of damage, tyres should be removed periodically, and the rims painted inside with a hard and flexible enamel, such as ripolin.

Forming the "Bead."

To resume—the bead is composed of a strip or cord of rubber run through a die corresponding in shape with the transverse section of the bead, and is composed, like all the rubber used in the construction of the tyre, of a vulcanizable mixing. This mixing is so compounded that when subjected to the same heat as the remainder of the tyre it becomes harder, and so gives the necessary rigidity to the bead.

Thickness of the Casing.

The strength of the tyre, as I said before, depends upon the casing, and this varies according to the number of plies of canvas employed. The standard make of tyres contain as follows:—Voiturette tyres, 3 plies of light canvas; light car tyres, 3 plies of heavy canvas; touring cars, 4 plies of heavy canvas; heavy touring cars, 5 to 6 plies of heavy canvas. These have been found to give sufficient strength to the cover and in no great degree interfere with the elasticity.

Thickness not Necessarily Strength.

As the compressed fluid air within a tyre must be reached through the solid cover, it stands to reason that the cover should be as yielding, flexible, and sensitive, as it is consistent with road wear and tear, to interfere as little as possible with the quick communication of shock to the fluid cushion. It is a mistake to suppose that many plies of canvas necessarily mean strength. To add layers of canvas is merely to defeat the object of the pneumatic tyre. The ideal tyre would be one with an outside casing ⅛-in. thick, as tough as steel, and resilient as rubber, containing the fluid air.

The Rubber and Reinforcing Canvas.

Assuming that we have now completed the casing, it is ready to receive the rubber and reinforcing canvas. The calender used in proofing the rubber sheets is similar to the friction calender before described for preparing the canvas, except that the rolls are driven at even speed. The rubber, after passing between the steam-heated rolls, is taken away on a travelling apron in sheets of the required thickness, the thickness being regulated by setting the rolls closer or further apart as may be necessary. From the calender, the rubber goes in sheets to the cutters, who cut it into the necessary strips and pass it on to the tyre makers.

Completing the Outer Cover.

The man building up the tyre puts the thin sheet of rubber on the casing from bead to bead, then come the two strips of reinforcing canvas about 2 in. wide laid on round the tyre. These stiffen and strengthen the tread, and also raise it slightly at the wearing part. In building up this part of the tyre, a great deal of care and skill are necessary on the part of the workman, as it is at this stage that the proper thickness of rubber is needed to accurately fill the mould in which the tyre has to be finally shaped and fitted.

A Tricky Operation.

All automobilists are aware of the different shapes of tyres; some have a separate tread, and others again have a tread which is moulded on, and may be either square or round on the face. It depends on the particular type on which the workman is engaged, what thickness of rubber he shall apply to the casing, and it is in this operation that one of the greatest difficulties in connection with the tyre manufacture arises.

The Vulcanizing Mould or the "Lapping."

The tyre having passed through the various processes is now complete and ready for vulcanization. It is next put into an iron mould consisting of two sections closed by hydraulic pressure, and in this position it is vulcanized. After the tyre has been vulcanized it is complete and ready for use, with the exception of the necessary trimming off of any surplus rubber which may have been forced out at the junction of the two sections of the mould. Should the tyre be of the type fitted with a separate tread, the latter is built up by itself and attached to the casing with vulcanizing solution, the whole is then put on a suitable former and lapped with a fine cambric and vulcanized, hence the cloth-mark appearing on the treads of such tyres.

The Importance of Vulcanization.

On the point of vulcanization a little information will, I think, be useful to the users of pneumatic tyres. The process of vulcanizing rubber is somewhat analagous to that of baking bread, and whilst bread will stand a good deal of toasting, the border line between toast that is fit to eat and toast that is not, is very narrow. In the same way, the border line between a properly vulcanized tyre and an over-vulcanized tyre is also very fine. Hence the danger in front of the man requiring his tyre repaired and his necessity for sending it to a firm with technical skill and a proper knowledge of the properties of rubber—qualifications that can only be gained by years of practical experience.

The Effect of Vulcanizing Rubber.

So much depends on the way in which the rubber is vulcanized that it may be interesting if at this point I say a few words on the general subject of vulcanization. The process of vulcanization, accidentally discovered by Charles Goodyear about the year 1835, may be said to have initiated the rubber industry, which is now one of the most important in the world.

Rubber in its native or pure state is imperfectly elastic, and being readily affected by heat and cold is applicable to very few industrial purposes. In a state of perfect vulcanization, however, it becomes permanently elastic, and is absolutely unaffected by any changes of temperature.

Vulcanizing—and Vulcanizing.

Broadly speaking, vulcanization consists in chemically combining sulphur with the indiarubber. This is generally carried out by mixing the two together, and subjecting the compound to heat, which may vary according to circumstances from the melting point of sulphur, at which the vulcanization commences, up to 280° Fahr., or even more. The time during which tyres are exposed to the heat may vary from two to three hours, or thereabout. The sulphur is employed either in its pure state or in the form of a metallic sulphide, but the vast array of purposes to which rubber is now put, have rendered necessary almost endless variations and modifications on the original process.

Different qualities of rubber require different treatment. Para rubber, for instance, may be thoroughly vulcanized by treatment which would be quite inadequate in the case of Congo or other African rubber. On the other hand, a vulcanizer which will thoroughly vulcanize African rubber might quite easily destroy Para rubber by over vulcanizing it. Generally speaking, rubber is more frequently spoilt by over vulcanization than by under vulcanization.

The treatment of the various descriptions of rubber, in order to prepare it for the almost endless variety of purposes to which they are put, requires not only the closest attention, but necessitates a very large amount of costly experimental work.

Not an Amateur's Process.

There are few, if any, goods in which perfect vulcanization is so essential as in pneumatic tyres. This point of vulcanization cannot be too strongly impressed upon the reader. As he doubtless knows, there are a great many tyre vulcanizers being put on the market which, according to the advertisements, are quite easily worked, and enable anyone to repair his own tyres at home without any special knowledge of the handling of rubber. But anyone who had seen as much of the repair of tyres as I have, would form a different opinion with regard to the ease with which they can be repaired. The case is somewhat similar to that of the man who sells a box of paints and says anyone can use them. Quite so; but it is only the artist or the man with skill who can get any use out of them. Many try, but few succeed.

Two Methods of Making Inner Tubes.

Dealing next with the manufacture of inner tubes, I should like to explain that these are made in two ways. In one case the mixed rubber is put into a machine somewhat similar in principle to a sausage machine. From this, it is forced through a die in the form of a tube, and passed on to a mandril, being then lapped round with a fine cloth, which holds it in form while it is being vulcanized. In the other case the sheets of mixed rubber are cut up into strips the length of the required tube, sufficiently wide to form its circumference, the mandril being lapped as before described. They are then put in the vulcanizing chamber, and "cured" by the steam method. Steam is used through all the tyre process for vulcanization. The moulded type of tube, which was put on the market about a year ago, has, I believe, been withdrawn owing to its unsatisfactory wearing qualities. It is unfortunate that of late a large number of very inferior tubes have been put on the market, the result, no doubt, of the demand for a cheap tube, with the price of raw rubber at about 5*s*. per lb. These tubes have little or no life. They lack the elasticity necessary to adjust themselves in their proper positions, and so get nipped. Their surface becomes impressed or "pitted" by contact with the canvas lining of the cover. They extend in length, and do not return to their natural position, and thus get creased and nipped when in use. In dealing with tubes, the chief points to be considered are, first, that the tube is the correct size for the cover; second, that the cover and tube are adjusted in their proper place before inflating; third, that a good supply of French chalk is put inside the cover to act as a lubricant.

Satisfactory Tubes.

So much depends on the reliability of the tube that it should be made from the best material only, that is to say, from vulcanized rubber possessing the maximum of toughness and elasticity. The material of which it is composed must also be of such a nature that in the event of its being damaged by a cut or a burst, it can be repaired without the risk of being weakened at that part. The ends of the tube should be joined in such a manner that there is no risk of opening at the joint after wear, and the valve should be so inserted that there is no chance of leakage round its seat after it has been for some time in use. It is of great importance that the joining and the valve patch should project as little as possible beyond the surface of the tube, so as to minimise the risk of friction between the tube and the cover. For the same reason holes should be repaired by means of plugging and not by projecting patches. In a tube, recently brought out by my firm—the "Victoria Jointless" tube—(1) the ends are brought together and vulcanized at the joint, so as to avoid the overlapping of the one on the other, and (2) the valve-patch is put *inside* the tube so as to dispense with the usual projection on the outer surface.

* * * *

Paying for the Splendour.

SOME little time back the Surrey Joint Committee, or whatever that august body that controls the police is called, expended the sum of £50 odd on a new uniform for the Chief Constable of the County, Captain Sant. We hazarded some vain guesses at the time regarding the magnificent spectacle this official must present when arrayed in these gloriously expensive habiliments.

The results of the expenditure have been observable lately on the stretch of road between the top of Pain's Hill and Redhill, that is to say, just the other side of Cobham, on the way to Portsmouth. Here there is a fine flat stretch of road with no cross-roads opening into it, except just at the top of the hill last mentioned, and everybody has been accustomed to drive along it fairly fast without fear of causing any danger to the public. At this spot the police have organised a new trap as being the most likely stretch they could pitch upon, and quite a large amount in fines has been raked in in consequence. As the expensive uniform has probably now been paid for, perhaps the trap will fall into disuse, unless the Joint Committee have an eye on similar splendour for themselves.

RACES, RECORDS, AND TRIALS.

CANNES MOTOR MEETING.—Grigg on his 35-h.p. Daimler Car during the flying kilometre test on the flat, which he accomplished at a speed of 90 kilometres per hour. Grigg and his British-built car secured the Cannes Automobile Club Cup for the series of events organised for the touring cars.

Cannes Automobile Fortnight.

As in former years, Cannes is the scene of the opening motor meeting of the season. This very enjoyable gathering of motorists has just been concluded, the result of the chief item of the programme, viz., the series of tourist car tests, being particularly gratifying to Britishers, inasmuch as the Cannes Automobile Cup is secured by Grigg with his 35-h.p. Daimler car. The meeting opened with motor boat contests in the bay. The tourist car trial consisted of a fuel-consumption trial (1 litre), which took place in the Masque-de-Fer Square, a test of brakes on the Adrets, speed tests over the flying kilometre, and a hill climb at Antibes. The results, in which, as already mentioned, a Daimler car was triumphant, are as follows:—

	Car and Driver.	Consumption (1 litre).		Brake Test.	Flying kilom.		Hill Climb.	Points.
		Distance.	Time.					
		kil.	m.	metres.	m.	s.	passr.	
1	35-h.p. Daimler (Grigg)	4·40	13	15·0	0	40	7	196·29
2	18-h.p. Peugeot (Loubet)	8·73	23	7·65	1	1	6	190·51
3	12-h.p. Clement (Gallice)	10·37	29	12·95	1	9	5	182·23
4	18-h.p. Peugeot (Liegard)	4·31	9	8·25	0	57	6	171·09
5	25-h.p. Hotchkiss ...	3·77	9	7·15	0	56	6	165·68
6	8-h.p. Renault (Mounier)	10·54	28	4·95	1	25	2	122·24

Johannesburg to Durban.

EFFORTS are being made by the Natal Automobile Club to organise, during the coming season, a trial for cars between the above two points in South Africa, a distance of about 500 miles. If successful in their object, it should considerably help in forwarding the spread of the automobile movement in our African Colony.

Tourist Trophy Race, 1906.

THE list of first entries for this important race, which is to take place this year for the second time on September 27th, again in the Isle of Man, has been issued by the Automobile Club. These comprise the following vehicles:—

	ENTRANT.	CAR.
1.	Mr. John S. Napier	Arrol-Johnston.
2.	Mr. A. Rawlinson	Darracq.
3.	Mr. A. Rawlinson	Darracq.
4.	Hon. C. S. Rolls	Rolls-Royce.
5.	Hon. C. S. Rolls	Rolls-Royce.
6.	Mr. Warwick J. Wright	Minerva.
7.	Mr. D. Citroen	Minerva.
8.	Mr. T. B. Browne	James and Browne.
9.	Mr. C. Harman Wigan	Vinot Deguingand.
10.	Mr. John S. Napier	Arrol-Johnston.
11.	Mr. Alec Govan	Argyll.
12.	Mr. Alec Govan	Argyll.
13.	Mr. Harry Smith	Rover.
14.	Mr. Albert Brown	Brown.
15.	Mr. E. H. Lancaster	Clément.
16.	Mr. Claude Watney	Pipe.
17.	Mr. T. C. Pullinger	Humber.
18.	Mr. Edward Powell	Humber.
19.	Capt. W. E. D. Owen	Ariès.
20.	Capt. W. E. D. Owen	Ariès.
21.	Mr. R. L. Jefferson	Rover.
22.	Mr. F. Guy Lewin	Peugeot.
23.	Mr. J. Ernest Hutton	Berliet.
24.	Mr. J. D. Siddeley	Wolseley.
25.	Mr. R. R. Brown	Wolseley.
26.	Mr. J. Ernest Hutton	Berliet.

The Automobile Club are particularly anxious to again emphasise, what has been pointed out so continuously and repeatedly in THE AUTOMOTOR JOURNAL, that the popular idea of the race being one to promote economy in fuel consumption is entirely incorrect. The primary object of the club in fixing a definite allowance of fuel for a given distance is simply to limit the horse-power, and thereby the speed of the competing vehicles, thus restricting the race to a definite type of *bona fide* touring car. This was considered the best method of limiting engine power, and was chosen on account of its simplicity, after other methods had been carefully considered by the committee responsible. Needless to say, those who have followed, even in a very casual way, the series of important articles which have appeared upon the subject in THE AUTOMOTOR JOURNAL, will have fully realised the importance of bringing home to everybody interested in the automobile movement this very salient fact.

A.C.G.B.I. Tyre, Lamp, and Speedometer Trials.

DURING the week ending Saturday, March 17th, the Dennis car made non-stop runs on each day, and succeeded in completing 2,446 miles since the start.

On Thursday, 15th inst, the Vulcan and Warner speedometers completed their 2,000 miles trial without incident, and on the next day the Jones, Gratze, and Cowey instruments similarly completed their tests. These devices have been replaced by the Kirby and Elliot speed indicators and the Cowey recorder, all of which made non-stop runs.

The report on the Collier tyres for the week is as follows :—

36-inch.—4 non-stop runs. Changed rear tyre once owing to burst. Rear tyre punctured once. Car under repair during one day.

34-inch.—5 non-stop runs. Rear tyre punctured once.

815-mm. (experimental).—4 non-stop runs. Rear tyre punctured once. Car under repair during one day.

Lamps.—

Headlights.—Worsnop.—Choked pipe twice. Went out twice.

Polkey.—Went out five times. Car under repair during one day.

Tail Lamps.—Ryta and Hoult.—Went out once. Car under repair during one day.

Metallic Mirrors.—Went out twice. Car under repair during one day.

Worsnop.—Went out several times.

Pradeau Wheel Trials.

THE test of this spring-wheel has now been abandoned, as the result of another broken axle on the car to which they were fitted. From the official report issued by the club, we learn that "It happened at Gerrard's Cross, about 20 miles from London, at a quarter past eight on Wednesday evening, and since this was the second time during the trial that the car had suffered a broken rear axle, it was evident that there was some unusual cause for the mischief. The entrants discovered that the wheels were too heavy for the car to which they were fitted, and consequently withdrew from the trial."

Frome's Hill Climb.

WE are reminded by the Herefordshire A.C. that an open hill-climbing contest will take place on Frome's Hill on Thursday, May 24th, for touring cars not exceeding 35-h.p.

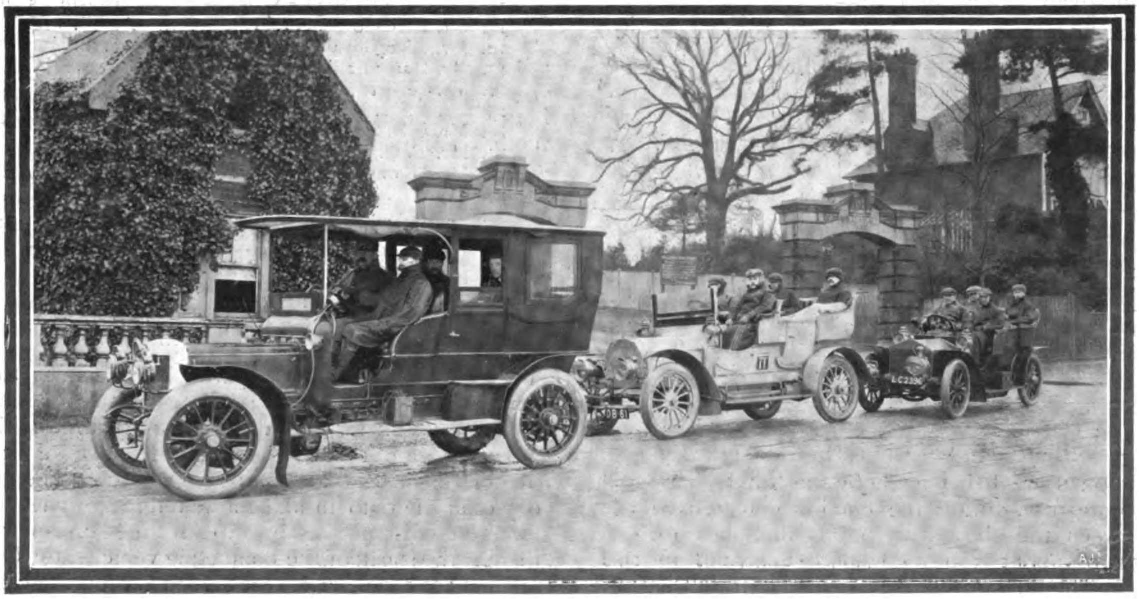
It will be remembered that this is the hill which troubled so many of the cars in the Small Car Trials. It is 1,289 yards long, and the steepest gradient is 1 in 6·37.

The contest will be held under A.C.G.B.I. rules, and the times will be taken by the official timekeepers of that body.

Entries, which close on Saturday, May 19th, should be sent to the hon. sec., Mr. Wilfred Groom. Steam cars, it is announced, are not eligible to compete.

Commercial Vehicle Trials.

ACTION has recently been taken by the Motor Van and Wagon Users' Association with a view to pushing forward the proposed trials of commercial motor vehicles, which for a long time have been under consideration by the Automobile Club. The Association are desirous that these trials should be held without further delay, and have asked the Automobile Club to consider the desirability of deputing its authority, so far as these trials are concerned, to the Motor Van and Wagon Users' Association. The matter has been, it appears, favourably considered by the Club, who have referred the question to the committee appointed to deal with these matters, with instructions to confer with the Motor Van and Wagon Users' Association with a view to arranging for the trials, and to report to the Committee of the Club at the earliest possible moment.



A.C.G.B.I. TYRE, SPEEDOMETER AND LAMP TRIALS.—The cars on the 16th day's run of these Trials near Barnet. A rainy day's experience.

Scottish Reliability Trial, 1906.

TWENTY entries have already been received for this Trial, for which the list does not close till 2nd May.

It has been pointed out that the competitors in this Trial in June, and those in the Auto-Cycle Club's end to end run, will be, to some extent, on the same roads at the same time. On June 14th both parties will have to cover the roads between Stirling and Perth. The next day—the third of the Scottish trials—the cyclists will be leaving Pillochry while the cars are making for it, and if they do not meet about Carrbridge it will be a near thing. From that point the two parties will be going farther and farther apart.

Belgian Racing Events.

THE dates fixed for the two important events organised by the Belgian A.C. are as follows:—August 13th, Circuit des Ardennes; August 18th, Coupe de Liedekerke.

Circuit Européen.

THE full text of the rules of this big Continental event have now been re-issued by the A.C. de France, after having received some slight modifications since they were first published in THE AUTOMOTOR JOURNAL some months ago. They are for all practical purposes identical with those issued in the first instance. There is an attempt in the rules to induce those interested to enter sets of tyres for official observation and awards, subject, however, to not less than five entries being received. The test, which would have to be endured under the conditions of the circuit, should be of very general interest. Since the elimination of official observers riding on the cars and taking notes of all stoppages, &c., and thereby limiting the speed within reasonable limits, racing "all out" with a view to making up time after any breakdowns will be, no doubt, the rule, and the test should therefore be a very severe one, especially on the tyres. Already entries are being lodged with the A.C. de France, the earliest including two Darracqs, two Mercedes, a Peugeot Frères car, a Wolseley, a Regina-Dixi, four De Dions, and a Dixi.

The French Grand Prix.

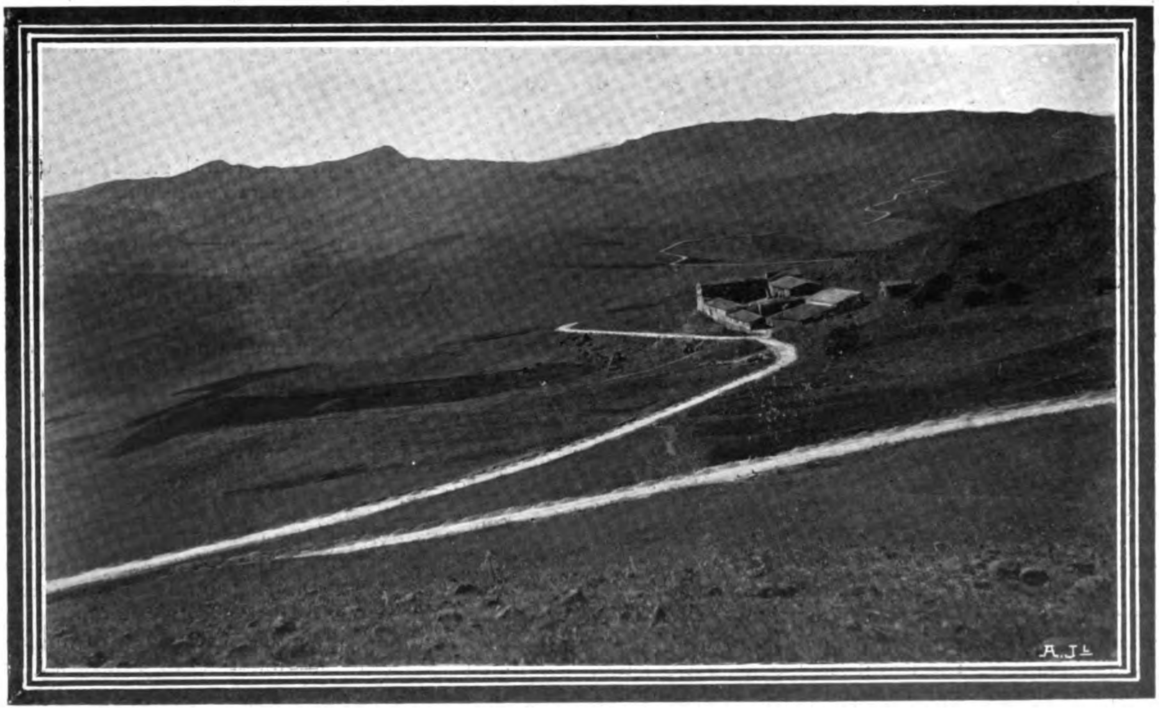
AT the end of last week the full regulations of the Grand Prix of the A.C. de France for racing cars, which is to take place on June 26th and 27th, were issued by the French Club. In every respect (with one exception) these agree with the details which have been published from time to time in the columns of THE AUTOMOTOR JOURNAL. The only exception is that four hours instead of three hours behind the fastest car on the first day will eliminate such car from starting on the second day in the race.

Pont-de-Gennes, about 19 kiloms. from Mans, has, as intimated originally in THE AUTOMOTOR JOURNAL some months ago, been selected as the starting point for this big race.

For the convenience of our readers we summarise below the chief points of these rules, which have from time to time been given by us as they became available.

The Sarthe Circuit is the one selected for the race on June 26th and 27th. It will occupy two consecutive days, each day about 600 kiloms. having to be covered.

A maximum of three cars only can be entered by each maker. Makers employing motors or mechanism constructed under a licence or name of any other maker, are included in this maximum of three, no allowance being made for any distinction in nationality of the make of any such car. In the event of a dispute as to which manufacturer under such circumstances shall have the



THE TARGA FLORIO RACE IN SICILY.—Last week we published a series of very striking photographs of scenes upon the selected course of this important race in Sicily, which is to be held in the early part of May. The above photograph shows another of the long winding mountain roads on the course, near Castellana. It is a remarkable stretch of country where the cars can be seen for miles.

prior right of running one of the three cars permitted under the rules, the French Club will decide the matter by giving preference to such maker who has sold to the public the largest number of such vehicles during the past three years. The entrance fee for each car is 5,000 francs up to April 30th, after which, and up to May 15th, the fee will be double.

After the first day's race drivers may be changed on each vehicle. Mechanicians may be changed during the race, but only at the points allotted for replenishments, and then only under official supervision. Makers, when naming the drivers of their cars, must also give proof in writing that such driver has actually agreed to drive the car, and the driver will not then be permitted to drive any other car in the race until the French Club have been satisfied that such alteration is the wish of both the maker and the driver. Each driver must, prior to the race, produce his proper Government certificates entitling him to drive a car ot the character to which he is nominated.

All cars must have an engine-driven reverse. The maximum weight allowed for the chassis is 1,000 kilogs., with 7 kilogs. extra for magneto. Lamps, tools, &c., are not included in this weight. Each car must have its exhaust box fitted horizontally towards the back, and sufficiently elevated at the end to avoid raising the dust. Each vehicle must carry two persons (neither more nor less), side by side, of an average weight of 60 kilogs., any under-weight being made up by ballast.

A closed "parc" will be instituted, into which all competing cars must be driven immediately after finishing the first day's race, each vehicle being located in a distinct and separate compartment, and nobody, under any conditions whatsoever, will be permitted to approach any car until the moment for starting the following morning. Upon arrival at the "parc," the driver will only be permitted to stop his motor and shut off the oil and petrol. On the morning of the second day each car will be handed over to the authorised driver at the moment when each respective car is entitled to start. From that moment the time of each car will be taken as having started, the driver having to replenish with petrol, oil, &c., and get away on the course in his own time. Weighing in takes place on June 24th, and regulations for these proceedings will be issued later.

Replenishments, changing of parts, and repairs, whether to the tyres, motor, or mechanism, &c., must be entirely carried out by the two occupants of the car. Each competing maker will be permitted two replenishing depôts on the course at points on the circuit which will be duly notified. These depôts will be grouped, and the allotment will be by ballot. No workman will be permitted on the course, and competing cars must be driven off the course when undergoing any changing or replenishing by the occupants of the car. No changing of tyres, or replenishment of water, oil, or petrol will be permitted other than at the official depôts allotted for the purpose. Manufacturers of tyres or other necessaries for the cars can obtain an allotment, if they desire it, of special depôts in connection with the replenishing depôts for the cars, the charge being 1,000 francs for two such special depôts.

The start on the first day will be at 4 a.m., at intervals of one minute between each car, the order of starting being determined on the first day by ballot. The starting hour will be fixed later for the second day, each car being started at a corresponding time after the first to that at which it finished the previous night, no car being allowed to start on the second day which has occupied on the first day more than four hours longer than the fastest car in covering the full course. Two special men per car will, if desired, be permitted for the exclusive purpose of turning the starting handle at each day's start.

Already entries are being made, the first list being as follows:—

Drivers.

3 Darracqs, MM. Hemery, Wagner, and Hanriot.
3 Panhard-Levassors, MM. Heath, Teste, and Tart.
3 Brasiers, MM. Baras, Lebrun, and Barillier.

* * * *

AERONAUTICS.

German Military Aeronautics.

We have already mentioned the fact that the Zeppelin experiments are to be continued, under the patronage of the German Emperor. It is now stated that His Majesty has obtained the co-operation of four prominent millionaires, who have between them subscribed £50,000 towards the experiments. It is intended also to experiment with other types of airship, the Emperor being very keen on obtaining something practical from a military point of view, as, owing to the successes of the Lebaudy airship, the French may be said to have obtained a new arm for their military service, in which respect they have left the Germans very considerably in the rear.

The British Experiments.

We also referred to the important and instructive experiments which, mainly under the supervision of Mr. Cody and Col. Templer, have been carried out by the balloon companies of the Royal Engineers at Aldershot. The gliding machine and manlifting kites have already been referred to in this column, but it is of interest to learn that in recent experiments the man-lifting kites have proved themselves to be most thoroughly reliable in detecting, even in rough and cloudy weather, flank marches at a very considerable distance—the results of the observations of course being communicated from the kite by means of a telephone. On April 1st a new instructorship is to be added to the army by the appointment of an instructor in kite-flying. His salary is to be £600 per annum. Col. Templer is also superintending the manufacture of an airship of the navigable balloon type, the gas-vessel of which, we understand, will be some 140 ft. long by 75 ft. in diameter (a rather podgy-looking gas-vessel). The propeller is, of course, to be driven by a petrol motor.

The Kite Boat.

Mr. Cody, who has already crossed the Channel by means of a boat drawn by kites, and has been giving demonstrations with this method of boat traction at the Crystal Palace, intends very shortly attempting to cross the Atlantic, and ultimately reach South America. The trip is intended at the same time to provide a demonstration of the value of kites for saving castaway mariners, for which purpose Mr. Cody will, with his boat and kites, repeatedly adopt that rôle, being dropped astern from the vessels that accompany him.

CORRESPONDENCE.

****The name and address of the writer* (*not necessarily for publication*) MUST *in all cases accompany letters intended for insertion, or containing queries.*

THREE YEARS' GUARANTEE AND ENGINE RATING.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR.—We are much interested in the correspondence appearing in your columns, in consequence of Mr. Edge's three years' guarantee and the discussion it has raised as to the horse-power of various cars in connection with their price. Mr. Weigel assumes, and we think correctly, that 10 cubic inches cylinder capacity per 1,000 r.p.m., represents 1 h.p., on which basis the 6-cylinder Napier is a more expensive car, per h.p. than the others he names. However, if Mr. Edge can sell his cars for the price quoted, we cannot see any reason why he should lower the price to suit Mr. Weigel; or why, if he finds that giving a three years' guarantee brings him business, he should not give that guarantee. We are more interested, however, in the question of horse-power. Mr. Johnson claims that the Napier engine gives 48 h.p., but does not state at what r.p.m. We believe that this power is claimed at 1650 r.p.m. which is called "normal" engine speed. Now Mr. Johnson does not give any other make of engine credit for running at a higher speed than 1,000 r.p.m., and his comparison is therefore hardly fair. The whole question turns on this point, what is "normal" engine speed? We believe that the 40-h.p. Napier, when not geared specially low as for the Brighton to Edinburgh trip, is fitted with a gear giving, on the direct drive, approximately 30 m.p.h. at 1,000 r.p.m. of the engine, which means that the "normal" engine speed is only attained when the car is running at 48 miles per hour. Can this be "normal" engine speed? We are inclined to think that the expression is altogether misleading and that modern motor car engines have no "normal" speed. Anyhow the present system of rating, whereby it is left to the maker to fix his h.p. and engine speed, according to his own fancy, is most unsatisfactory.

As makers of 6-cylinder engines, which run up to 2,000 r.p.m., with a bore and stroke of 4 in. × 4¼ in., we would like to know what is the correct rating from the point of view of the public who buy cars. We consider, rightly or wrongly, that "normal" speed, if it means anything at all, means the speed at which the engine is run in average running on the road, although we think it essential that an engine should be capable when required of running at higher speeds. We think it would be of considerable interest to have the views of manufacturers and the public who are buyers on this point, especially the buyers. Perhaps a short editorial might have the effect of raising an interesting discussion which would lead to a more satisfactory system of engine rating than exists at present—in any case, the price should be disregarded, as the value of a car cannot be arrived at merely by knowing the size of the cylinders.

Yours faithfully,
THE STANDARD MOTOR CO., LTD.
Coventry, March 21. R. W. Maudslay.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I appreciate Mr. Edge's modesty in not having answered my letter personally, though I do not admire his tactics, and am inclined to believe that the modesty is merely a useful temporary disease.

First, I will take the letters of "Owner" and B. Johnson, of S. F. Edge, Limited. "Owner" suggests that the Napier 4-inch by 4-inch 6-cylinder engine gives 48 h.p. Might I ask what he bases his calculations upon, if he has based them upon any calculations at all? Or is it a mere bald statement, repeating what he has been told? Apart from which, in answer to both "Owner" and Mr. Johnson, I would point out to them that it is immaterial for the sake of comparison what unit is taken, and if for their amusement they are desirous of believing that 300 cubical inch contents will develop 48 h.p., then all the other makes that I mentioned must be calculated upon the same unit and basis. Thus:—

Unit of Calculation—300 cubical inch contents take at (*sic*) 48 h.p. (as desired).

Napier	... 300	cubical inch	contents	would	develop	48	b.h.p.
Maudslay	... 380	,,	,,	,,	,,	61	,,
Fiat ..	... 450	,,	,,	,,	,,	72	,,
Siddeley	... 430	,,	,,	,,	,,	69	,,
Daimler	... 520	,,	,,	,,	,,	83	,,
Itala	... 460	,,	,,	,,	,,	74	,,
Dietrich	... 510	,,	,,	,,	,,	81	,,

It is really immaterial, I would suggest to these gentlemen, whether they call their 300 cubical inch contents a thousand horse-power, but they surely must not suggest that 300 cubical inch contents would give a greater b.h.p. than 380, 450, 430, 520, 460, and 510 cubical inch contents respectively. I am merely taking their basis or unit, which naturally is absurd, for it would be impossible to obtain 48 b.h.p. from 300 cubical inch contents; but, notwithstanding, I have put myself as shown above entirely at their disposal. It is therefore again shown that the differences in prices are similar.

Might I suggest to Mr. Johnson that he study this question a little before he rushes into print?

Dealing with Mr. Lambert, I really do not know whether he is trying to out-do Shakespeare; but if he is, might I suggest that he dramatised a subject that he understood, because if he is suggesting that the cubical inch contents depend upon the length of the stroke, then he is showing absolute ignorance of his subject. Permit me to inform that gentleman that cubical contents of a cylinder are measured by the area of what it contains. It might be any shape; it might be fat or thin, or long or short; but whatever the area inside is, we call that cubical inch contents. Might I give this gentleman the same advice as I gave to Mr. Johnson, viz., to go and ask somebody what cubical inch contents mean before he writes about them, and above all let me inform him that length of stroke has nothing to do with cubical inch content.

I will next deal with the secretary of Messrs. S. F. Edge. I really do not know why he wants to argue about British and foreign manufacturers, when we are arguing cubical inch contents, the brake horse-power that they give, and the comparative values of cars.

If Mr. Vane is going to suggest that a British manufacturer can obtain more out of the calorific value of petrol than a foreign can, I am very sorry for his want of knowledge. I am afraid Nature gave to Frenchmen, Englishmen, Germans, Dutchmen, and everybody else, the same value to natural products. Mr. Vane did not touch upon a single question as regards the cubical inch contents of the car he represents, or a comparison thereof to other makes. I would refer him to my answer to "Owner" and Mr. Johnson. Mr. Vane might have occupied his time and ability in suggesting why, notwithstanding that his firm are twice the price of other firms, they should follow Mr. Edge's lead and give three years' guarantee. Or, to put it in another way, I suggest that the public would be paying for the three years' guarantee by paying double the amount of money at the first outlay. Mr. Vane might have been able to answer, or try to answer, why they were not, instead of entering into some fairy story about British and foreign manufacturers.

The next gentleman I will deal with is Mr. Arthur Brown, who, I presume, is the same Mr. Arthur Brown, who is an old member of the North Road Cycling Club, and an old friend of Mr. Edge's, and I am sure Mr. Edge must be indebted to him for having taken up the matter on his behalf. Mr. Brown suggests that it is well known to all motor manufacturers that a 6-cylinder engine is superior to the 4-cylinder engine. Now, as one motor manufacturer, I beg to say in my opinion it is not. I have never entered into the arguments which have appeared in many motor car journals, as I have thought the matter too absurd, but if the editor of the excellent AUTOMOTOR JOURNAL would lend me its pages, I think I could quickly give a few facts proving that the 6-cylinder engine is in nine cases out of ten inferior to the 4-cylinder engine for automobile purposes. Now, as regards all other manufacturers knowing it, with the exception of myself, Mr. Brown has had, I presume, some private information, because I should deduce the opposite. Out of, let us say, 350 motor car manufacturers, there are, I believe, four making 6-cylinder engines. Do they constitute the whole of the motoring industry, or are the other 346 not to be taken into account? I would further suggest that for every 6-cylinder engine that is built there are at least three to four thousand 4-cylinder cars turned out. These figures do not seem to bear out Mr. Brown's statement, unless the manufacturers have made a *confidante* of Mr. Brown, and told him their deep and private opinions, which I certainly fail to believe.

With due respect to Mr. Brown, I will not be drawn into an argument (without the permission of the editor) of 4 *versus* 6, and I would suggest that his letter has nothing whatsoever to do with the point I raised, and that is, that given any unit, the comparison between Mr. Edge's car and other cars works out that Mr. Edge's goods are twice the price of other people's goods. That is the question that I put before the readers of THE AUTOMOTOR JOURNAL, and I have only been answered by the following:—

One gentleman wants another unit, another gentleman suggests that the length of stroke affects cubical inch contents, another gentleman takes British products in comparison with foreign products, one other gentleman suggests a comparison between 6-cylinders and 4-cylinders, and another gentleman in the coolest possible manner puts down that 300 cubical inch contents equals 48 b.h.p., and 380 only equals 38 b.h.p., and so on, or in other words that the greater is the lesser, and the lesser is the greater; but not a single one of them goes into my question at all, and, therefore, we may leave it, *that given any unit* upon which to base a comparison between Mr. Edge's manufactures and the manuactures of the six other firms I name, Mr. Edge's goods are, in comparison, between £600 and £700 in each and every case dearer than his competitors, and he therefore charges a very good price for his three years' guarantee.—Faithfully yours,

D. M. Weigel.

P.S.—Mr. Vane suggests that I have taken the price at £1,250 instead of £1,050. My price is quite correct and he admits it in the columns of a contemporary journal, so why contradict it in this one? Besides, why stick at trifles, if he prefers the latter price then they are between £500 and £600 dearer. Is not that enough?

[So much has already been said on the subject of 6-cylinder *versus* 4-cylinder engines that we hardly deem it necessary to avail ourselves of Mr. Weigel's offer by "lending him our pages" for the purpose he proposes. Not only have we dealt with the subject ourselves in an entirely impartial spirit on several occasions, but we are inclined to think that only time and practical experience can convince the majority of motorists of the real relative merits of the two types of engine for any particular class of vehicle.—Ed.]

THE BRITISH OUTPUT.

To the Editor of The Automotor Journal.

Sir,—In view of the extreme interest that has been taken in regard to the figures which I recently gave on the enormous improvement in the British motor manufacturing trade (which figures have not apparently been very palatable reading to importers of foreign cars, owing to the fact that British manufacturers have exceeded foreign imports so far as motor cars are concerned), and so that there should be no misunderstanding as to how I arrived at my figures I will detail them to you.

List A gives the names of the firms to whom I wrote asking for their output per month, and at the bottom of this list you will see the total figures which these firms' output per month amounts to, namely, £357,628. These are the actual totals taken from the firms' written communications to me.

List B is a list of firms whose output has been estimated by a motoring contemporary, and, as you will see, the various units add up to the fair total of £65,450.

List C comprises eight firms whose names do not appear in either List A or B, but whose total value of output for the month, I have very excellent reasons for believing to be not less than £8,000 per month. This gives us a total amount of £431,078.

By accepting the motoring contemporary's figures, I have slightly reduced the total figures which I gave a week or two ago, but in some instances I know them to be below the correct value.

I think the most impartial critic of these figures will agree they are sufficiently large to justify the claim that was made that British manufacturers are turning out more motor cars than foreign importers were bringing into this country.—Yours truly,

March 16th.

S. F. Edge.

Output of British Motor Manufacturers, January, 1906.

List A. Manufacturers' Own Figures.	List B. From a Motor Paper.	£	List C. (Estimated).	
Argyll	Adams	700	Star ...	2,000
Arroll	Armstrong ...	2,000	Clarendon	
Ariel	Bell	500	Hamilton	
Albion	Clarkson ...	3,000	Iden	
Belsize	Calthorpe ...	600	Hubbard	
Brooke	Duryea	500	West	
Brotherhood	Eclipse	500	Rex	
Crossley	Leader	800	Coronet	
Daimler	Legros - Knowles	1,500		
Dennis	Maudslay ...	2,000		
Electromobile	Rover	7,500		
Foden	Rolls	2,000		
Humber	Ryknield ...	750		
Ivel	Simms	1,600		
James and Brown	Singer	1,000		
Straker	Standard ...	1,000		
Swift	Thornycroft ...	4,000		
Sunbeam	Thames Eng. ...	1,000		
Talbot	Vulcan... ...	500		
Vauxhall	Wolseley ...	34,000		
White and Poppe				
Napier				
Total £357,628		£65,450		£8,000
	Total ...	£431,078		

CLUBS AND ASSOCIATIONS.

A.C.G.B.I.

Mr. Edward Manville will read a paper before the Automobile Club on the 29th inst., the subject selected being "The Comparative Merits of Electrical Tramways and Motor Omnibuses."

Automobile and Cycle Engineers' Institute (London Section).

At the Second Ordinary Meeting of the Session, which will be held at the Royal United Service Institution, Whitehall, on Wednesday next, March 28th, Mr. W. Worby Beaumont will read a Paper on "Public Service Motor Transport." The chair will be taken by the President, Mr. Alex. E. Tucker, at 7.30 p.m.

Essex County A.C.

This club held its first dinner at the Great Eastern Hotel, Liverpool Street, on Saturday, the 10th inst. Mr. Burnett Tabrum, J.P., chairman of the committee, being at the last moment unable to preside through illness, the chair was taken by Mr. J. Gurney Fowler, J.P. Thirty-nine members and friends were present. The loyal toasts were followed by "The Club and Automobilism," proposed by Mr. T. Clarkson, and responded to by the hon. secretary, Mr. G. C. Tijou, who stated that the membership of the club, which had only been formed three months, numbered 71. Dr. Butler Harris then gave "The Visitors," and expressed the sorrow of the members at the illness of Mr. Tabrum, who had devoted so much time and energy to forward the interests of the club.

Importers' Protection Association.

We are informed that the following firms have recently been elected to membership of the above Association:—Messrs. E. H. Arnott, T. J. Harman and Co., Gaulois Tyres, Limited, Seymour's, Limited, H. M. Hobson, Limited, Moss and Woodds, J. E. Hutton, Limited, Walter Gutman, J. J. Mann, Andre Godin, J. Keele and Co., Anglo-American Motor Co., Limited, Straker and MacConnell, Limited, Gobron-Brillie British Motor Co., Limited.

Ladies' A.C.

In all eighteen cars, carrying seventy members and friends of the Ladies' A.C., were driven to Montreal, Sevenoaks, on Saturday last, in response to the invitation of the Countess of Amherst. The guests were received indoors by the Earl and Countess, tea subsequently being served in the ball-room, which was specially decorated for the occasion. The delightfully old-fashioned flower gardens and the golf course were visited in turn, the examination of the historical paintings and curios also absorbing a considerable amount of the time of the guests. Among those who were present at the gathering were:—Mrs. and Miss Amsden, Mr. and Mrs. Ash, Mrs. Foyster Bowen, the Hon. Lady Birkbeck, Mrs. Harold Browne, Mrs. William Cleaver, Mrs. Dawson, Mrs. Foster, Mrs. Guy Hardy, Miss Hills, Mrs. Loeffler, Miss Johnstone, Mrs. Kinloch, Colonel and Mrs. Morland, Mrs. Manville, Mrs. Merryweather, Miss Pilcher, Captain Pears, Mr. Leslie Sandars, Mr. Richardson, Mrs. C. Boevey, Miss Watts, Miss Beresford, Mrs. Ward, Lady Nore, and Miss d'Esterre-Hughes.

Leicestershire A.C.

The report just to hand of the Leicestershire Club is a very interesting *résumé* of the excellent work which has been performed during the past year by those responsible for the affairs of the club in that district. The report, in addition to the formal doings of the committees, details the efforts which have been made to further the interests of the sport and the industry by both the club as a whole and individual members. The membership has increased, and it is to be hoped that the series of sporting events, which are detailed in the report for the past year, may be repeated during the coming season.

Manchester A.C.

At the Annual Dinner of the Manchester Club, which took place at the Midland Hotel, Manchester, when Mr. J. A. Morris, the president, occupied the chair, the guests of the club included Alderman S. Rudman, Mr. C. A. Cripps, K.C., Mr. R. Peacock (Chief Constable of Manchester), Mr. J. W. Hallam (Chief Constable of Salford), Mr. Hepper (President of the Yorkshire A.C.), Mr. Sawley Brown (President of the Manchester Motor Club), &c.

The president, in proposing the toast of "The Local Governing Authorities," said that, as motorists, he thought they ought to paraphrase the hymn which he was taught to sing as a lad, which thanked everybody and everything that he was born a happy English child. He suggested that this hymn should be paraphrased to show how thankful they were that they were not motorists in the neighbourhood of Andover or the Brighton Road, or any of those districts which have become celebrated for their antagonism to the automobile movement. Fortunately, in the Manchester district, they had to thank their local governing authorities for having treated them in an enlightened and reasonable manner, the Chief Constables of Manchester and Salford being especially noted for their fairness and consideration. He said that he always felt that in going into Manchester or Salford he was not a sort of convict in embryo.

Mr. Rees Jeffreys, who responded on behalf of the Motor Union, was loud in his praise of the steady and consistent support which the members of the Manchester Club had always accorded the Union, particularly referring to the help which had been given to the joint-committee of the Automobile Club and the Motor Union which was appointed to deal with matters relating to the Royal Commission on the Motor Car Acts. The good work which was being done by this and other provincial clubs was undoubtedly, he thought, influencing public opinion, and the effect could be measured to a considerable extent by the General Election. It was a remarkably happy thing for automobilism that the election came when it did, for it had had its influence on Members of Parliament as well as on those who elected them. Every Member of the House of Commons owed some of his votes to the motor car, and every Member of that House had had the law broken on his behalf. If they were logical, which they were not, every member of Parliament would see that the 20-mile speed limit was abolished.

Scottish A.C.

AT a meeting of General Council held in Glasgow on Friday afternoon drafts of the Minutes of Agreements between the club and the Automobile Club of Great Britain and Ireland and the Motor Union, as these had been negotiated by the sub-committee, were submitted and these were approved for completion.

A scheme for the establishment of a department of the club relative to commercial vehicles, and which will include the users and makers of these, was submitted and discussed and remitted again to a Special Committee to be dealt with.

The admission of twenty-nine members was reported and confirmed.

The Society of Motor Manufacturers and Traders.

THE current circular of the Society of Motor Manufacturers and Traders illustrates the activity and large field of work covered by the motor trade body. Two legal matters affecting the trade are referred to—the Renault patent claim and the question of sparking plug infringements—with both of which the Society is dealing. In addition it is supporting a member in the matter of a claim for liability for the result of an accident to a customer's car which was being driven by a driver supplied to the customer at his expense in the ordinary way. In connection with the commercial vehicle section the Society is convening a meeting of parties interested, to consider the proposed London County Council Traffic Board scheme. A large increase of membership is reported, over twenty firms having joined the Society last month.

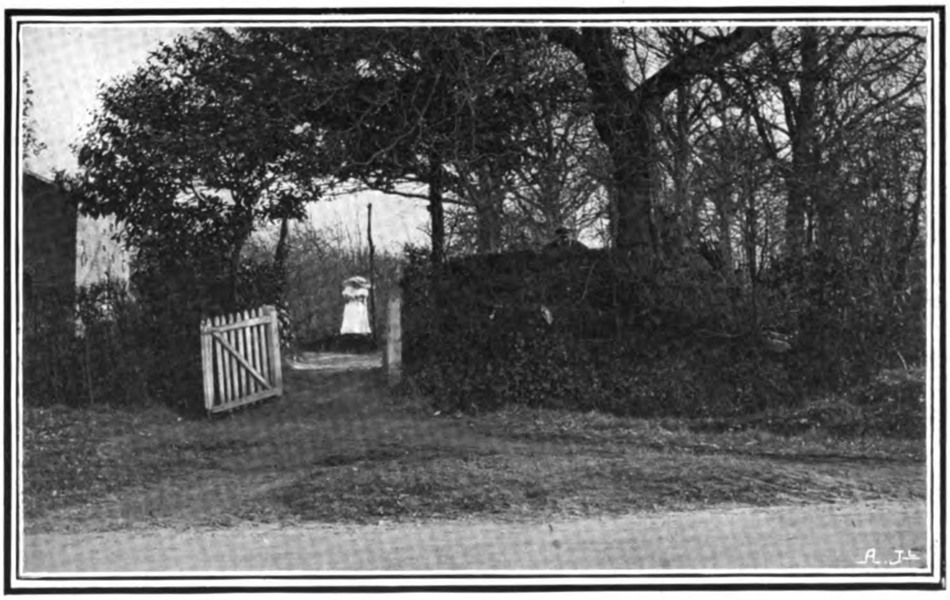
South Herts A.C.

UNDER the above title, a new motoring club has been formed, with headquarters at the Falcon Hotel, Waltham Cross, Dr. H. W. Spaight, of Holmewood, Waltham Cross, having undertaken the duties of secretary.

* * *

Too Much?

MRS. JULIA AGNES HUSSEY, aged 75, was being transported by wagonette along a road from Winchester Railway Station on an October day in 1904, when a motor car, coming up behind, apparently ran into the wagonette and damaged it, Mrs. Hussey being with difficulty extracted from the *débris*. She appeared to be none the worse for the accident, in spite of the fact that she had previously suffered from congestion of the lungs, but six weeks later she went to consult a Mayfair doctor, who at once assured her she was suffering from a severe form of heart complaint, which could only be cured by a trip abroad. Corsica was the spot selected by the Mayfair doctor, doubtless because its first syllable, "cor," is the Latin word for heart. When Mrs. Hussey arrived on the shores of the Mediterranean, however, the waves were running high, and Mrs. Hussey's heart, affected as it was, sank to her boots. So instead of braving the Gulf of Lions, she journeyed by rail to Rome, where, after having passed an agreeable three months, she came home restored, we are informed, to health, "for all practical purposes." In a case heard before Mr. Justice Ridley on Monday last Mrs. Hussey claimed from Mr. Pullman, the owner of the motor car, the sum of £225, which was practically the cost of her Continental tour, in spite of the fact that another doctor gave evidence to the effect that it was very improper to take so elderly a lady abroad. The jury, who were willing, one must think, to find any damages asked for against a motorist, awarded Mrs. Hussey the amount in question, though they put it a little differently, giving her £175 for the expense to which she had been "put," and £50 apparently for what an Irish solicitor once termed "anxiety of mind and sleepless nights."



SPORT (?) IN SURREY.—Near the 23rd milestone from London, on the Guildford Road, was the spot recently selected by the police of this district for one of their famous traps for motorists. Fortunately, this was discovered by the Automobile Association's scouts, and promptly "snapped" by the Chairman of the Association, Col. W. J. Bosworth, who was on inspection duty. The arrangement was for the policeman to hide behind a specially constructed hedge, seen on the right in the photo. In order to give confidence to passing motorists in case they caught sight of a peeping head over the hedge, it will be noticed that a simple village maiden was carefully "planted" in the background, through the gateway. Such ingenuity is surely worthy of a better application.

A new Darracq Landaulette, which has an English body specially designed by Keele and Co., who are making a special feature of this model. It forms an important feature of this Company's stand at the Agricultural Hall Show.

Cars for Indian Rajahs.

RAPID strides are being made by the motor in India. From the Daimler Company we learn that recently they have supplied Daimler cars to the Maharajah of Mysore, the Maharajah of Durbhunja, and the Rajah Nanshal Ali Khan.

Starting the Engine on Powerful Petrol Cars—A Query.

A CORRESPONDENT, who has had a considerable amount of experience with large racing cars, writes to ask why it should make so great a difference to the case of starting such engines if the by-pass in the exhaust-pipe is opened to atmosphere when turning the starting-handle. He points out that it is often almost impossible to start the engine at all unless the by-pass is open, but that immediately it has been opened the difficulty usually vanishes. Apparently, as he says, the very slight back-pressure set up by the silencer would barely account for any such phenomenon. Possibly some other readers of THE AUTOMOTOR JOURNAL who have experienced the same difficulty may be able to throw further light on this subject.

Two New Balloons.

THE Hon. C. S. Rolls has ordered two balloons through Messrs. Short Bros., the aeronautical engineers, One will be made of cambric, 42,000 cubic feet capacity. to carry four persons; this balloon will be owned jointly by Mr. Rolls and Messrs. J. Moore-Brabazon and Warwick J. Wright, two amateur members of the Aero Club of the U.K. The other balloon, which is for Mr. Rolls' own use, will be a specially small one of 17,500 cubic feet, made of Japanese silk for lightness ; this latter balloon, which will be the smallest ever seen in this country, will, when packed up, go into the back of an ordinary motor car, and Mr. Rolls intends to take it about with him on a car so that he can make an ascent at any place where that gas is available.

Both these balloons will be on view at the Aero Club Exhibition, which will be held at the Agricultural Hall, opening to-day (Saturday).

The Force of Habit.

IN the *Tatler*, last week, there is a good hit at the attitude of the police towards motorists in certain districts, in a drawing by Mr. Lawson Wood. It bears the legend, " Duty before All," and the words "Surrey Policeman (to motorist buried beneath his wrecked car): It's no use you hidin', sir. I must 'ave yer name an' address."

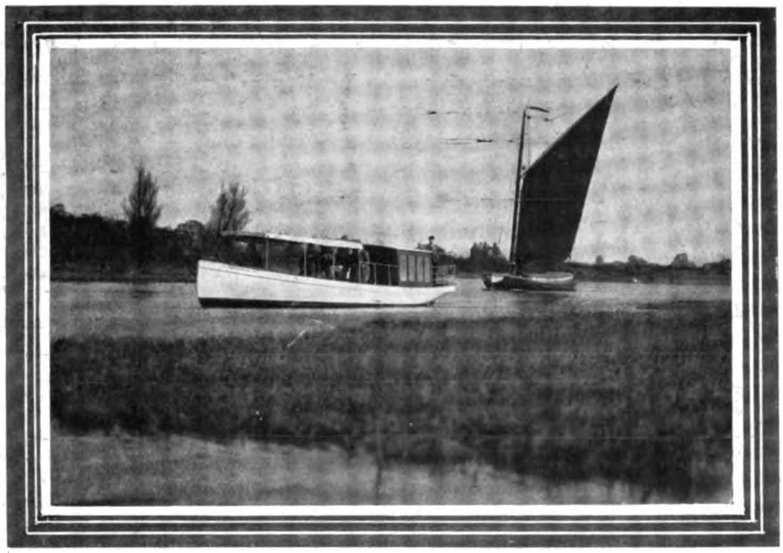
The Police and the Letter of the Law.

WHEN you cannot avoid unintentionally breaking the law, the best thing is to make sure that you avoid endangering public safety also. This was evidently the view taken by Mr. G. H. Lanchester, who one evening last week found that the carbide of his front acetylene lamps had given out as he was driving along Vicarage Road, at King's Heath, near Birmingham. He accordingly took off his tail light, and got a friend to hold it so as to show a white light forwards and a red light to the rear. He was duly summoned by the police for not illuminating his rear number. But the magistrates took a sensible view of the situation, and dismissed the case.

For De Dion Car Owners.

OWNERS of the present 6-h.p. and 8-h.p. De Dion cars, as well as those who possess earlier models that also have expanding clutches inside the gear-box will be interested to hear that the De Dion-Bouton Company have now published a special illustrated booklet in which each of the various types of expanding-clutch gear, that have been employed on the different models, is separately described in full detail. This year's cars of larger size have, of course, a gear-box and an external clutch of a totally different pattern, and consequently this convenient publication does not apply to them.

Remarkable in many ways is the new double landaulette of which we give an illustration above, for not only have exceptionally wide side-entrances been secured, but in spite of the 9 ft. 6 ins. wheel base, the vehicle can turn in a 40 ft. circle. The doors are no less than 23 ins. across, and are so hinged as to give a full opening, while each of the three seats has ample depth to ensure comfort, the back seat being 22 ins., thec entral seat 15 ins., and the front seat 19 ins.; there is, moreover, 20 ins. between the centre and rear seats. As will be recognised, this is one of the latest 18-h.p. White steam cars—a car built for Mr. I. C. Frere, of Wimbledon Park.



The "Enterprise," the latest passenger motor boat which has been built by Messrs. J. W. Brooke and Co., of Lowestoft. Our picture, which was taken on the Broads, shows this very charming vessel. She is 45 ft. long, with a 10-foot beam, and has an open well forward, covered with a canopy having rolling curtains, besides which a roomy cabin is provided aft of the engine. She is fitted with a 12-h.p. 3-cylinder Brooke motor, and has a solid 3-bladed propeller which runs at a speed of 900 r.p.m., giving a speed on the boat of 7½ m.p.h. The engine is fed by gravity, and 10 gals. of petrol are sufficient for a 10 hours' run. The exhaust is water-cooled. The "Enterprise" is essentially a one-man boat, being entirely manipulated by the steersman without his having to move from his position. This new craft is intended to ply for hire at Cambridge.

The Racing of Motor Omnibuses.

WE are glad to see that the articles which we published some weeks ago, with a view to deprecating the pernicious habit that motor 'bus companies and drivers seem disposed to develop of racing with and "nursing" one another, have received the approval of the *Daily Mail*, which, in a thoughtful article, that appeared on Tuesday last, devoted to the whole omnibus question, has followed our lead in this subject and drawn attention to the dangers to the public which result.

Motor Shows in America.

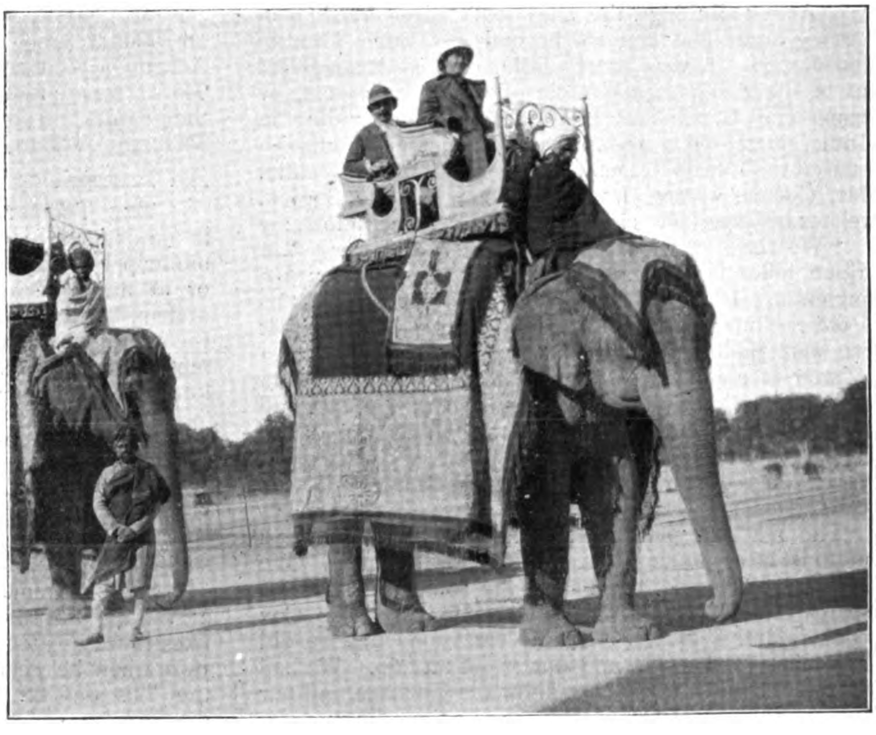
ENDEAVOURS are being made in the United States to further reduce the number of exhibitions which have hitherto been permitted by the ruling authorities. The National Association of Automobile Manufacturers now seek to confine American exhibitions to two national shows annually, viz., one in New York and the other in Chicago. In view of the arrangements already existing in America for the holding of shows for next season, considerable friction is likely to arise by the latest action of the National Association of Automobile Manufacturers.

"Time Writes No Wrinkle."

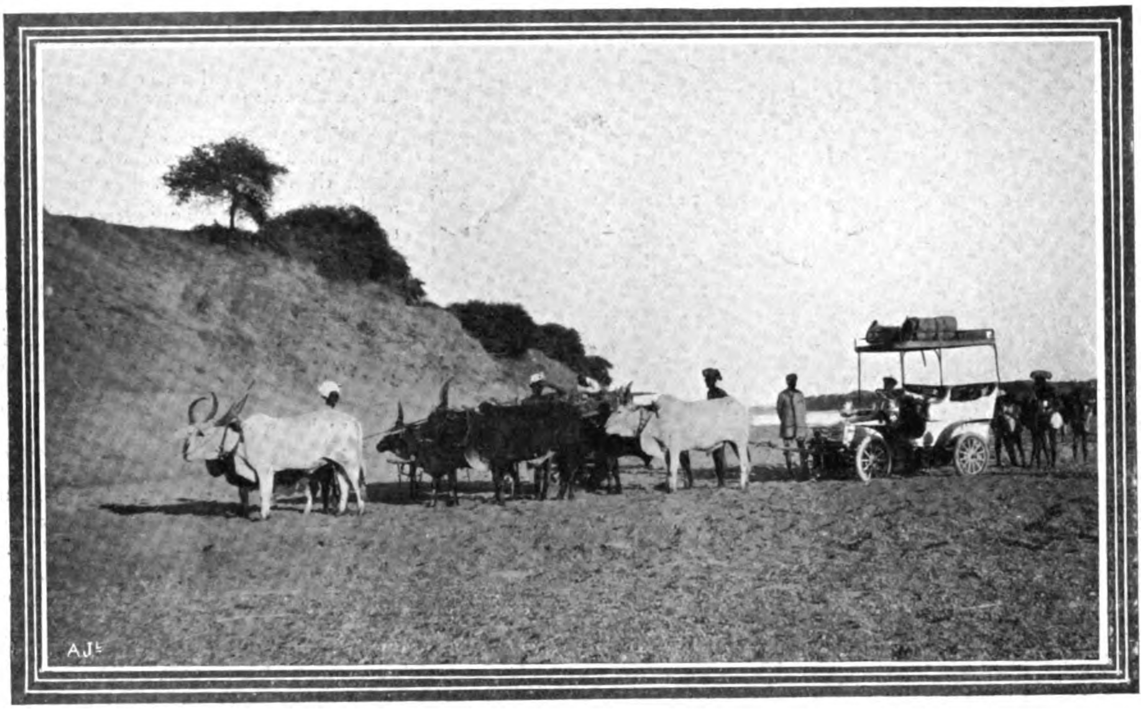
As an example of what the navigation on some of our picturesque canals can be, it is interesting to note an authentic recent case in which, on the Basingstoke Canal, an unfortunate barge has been detained for five weeks at Pirbright (near where the shooting goes on) by having to wait for an unsafe bridge to be shored up.

To Extinguish Burning Petrol.

WE are glad to learn that the antiquated notion of extinguishing a petrol fire by means of water is likely soon to receive official condemnation. The London Fire Brigade has been experimenting with the best means of putting out petrol fires. They procured heaps of shavings, saturated them with petrol, set them alight, and then tried to put them out. The first experiment they made was with a chemical extinguisher, which had very little effect indeed. Another machine, which projects water by means of compressed air, of the type carried on all the London horsed escapes, put the fire out in four minutes, while sand extinguished it in 45 seconds.



Mr. and Mrs. Charles J. Glidden are still increasing their mileage total in their world's touring on their much-tried Napier car. The latest report comes to us from Colombo, where Mr. Glidden has toured through Ceylon, a distance of 1,334 miles, bringing his total mileage up to 31,348. Our photograph above illustrates an incident in India, when Mrs. Glidden had the experience of riding on a State elephant in Patiala, where the native rulers have been in the habit of mainly employing elephants for locomotion. Many of them have now become owners of automobiles, with the result that in time the much honoured elephant will be relegated to a less important position, except for state occasions.



A JOURNEY BY MOTOR CAR FROM DELHI TO CALCUTTA.—An incident on the way, when the car had to be pulled through a river by coolies and oxen.

Motoring in India.

ABOVE all things, the automobile gives freedom in getting about the country beyond any other form of locomotion. A very breezy little narrative has reached us of the doings of a couple of young sportsmen, by name Hall C. Cheine and Cox, who, upon landing in India, purchased a 10-h.p. De Dion car, and forthwith started to drive up to Delhi and thence down to Calcutta. Mr. Cheine, writing from Bankipur Railway Station, relates his experiences in the happiest vein, as follows:—

"We have now completed the first and worst half 1,000 miles without an involuntary stop—not even a puncture. I had only to change a plug once, and this I did one morning before starting. When you hear that we were pulled through four rivers by coolies, one a quarter of a mile wide, by 6 oxen and 50 coolies, with the water within three inches of the sparking plugs, and she started at the other side at the third turn of the handle, and the water fairly spouted out of the silencer, you will agree with me that it says an awful lot for the car.

The roads at parts were awful—enough to make a motorist at home sit down and cry for his tyres. We had to lay down petrol all along the route, and took all spares with us, also bedding and food for two days. Cox cooked, and I looked after the car. One day we did 215 miles good roads, and our worst was 60. We had to take a man as we did not know the language, and our luggage was equal to another two, so that the car was laden up equal to five persons. We averaged most days 20 miles per hour, and one hour we did 28. You get good times, as the roads are dead straight for miles at bits. Our petrol consumption was 25 miles per gallon; very good, I consider. I have had some very good sport, and shot a magnificent tiger 9 ft. 7 in. Quite exciting!"

Victims' Addresses Wanted.

MOTORISTS who have been fined by the Kingston-on-Thames Bench for alleged violation of the Motor Car Act, upon the unsupported testimony of Superintendent Marks, we are requested to state, will oblige by sending their names and addresses, with details of their case, to the Secretary, Automobile Association, 18, Fleet Street, E.C.

An Enterprising Municipality.

THE Todmorden Corporation are promoting a Bill in Parliament to empower them to run a service of municipal motor 'buses. Some time ago they proposed, or at any rate discussed, the question of a tramway system, but the Corporation very wisely doubted whether the enormous initial cost would be justified. Now the motor 'bus has "arrived," and the sensible town councillors desire to be empowered to establish instead a motor 'bus service that will link up Todmorden, Burnley, Bacup, Rochdale, and Halifax. Good luck to their Bill, may it have a safe and speedy passage through Parliament! The committee, at any rate, agreed to approve the clause conferring the powers referred to.

Sense and the Silly Boy.

SENSIBLE remarks were made recently by Mr. Hopkins, a Metropolitan Magistrate, anent the usual silly boy who likes to set unattended motor cars running off on their own when he gets a chance. A motor 'bus driver left the 'bus outside "a certain place" with the engine running, for which he was fined 20*s.* and 4*s.* costs by Mr. Hopkins, who observed to the offending driver, "Don't you know that if you leave your 'bus with the machinery running some silly boy may get up and touch the levers?" and when the defendant retorted that a boy would not know how to do it, Mr. Hopkins, who evidently has made a study of boys, suggested that that was one of the subjects which they studied with particular care.

Battersea Polytechnic and Motor Instruction.

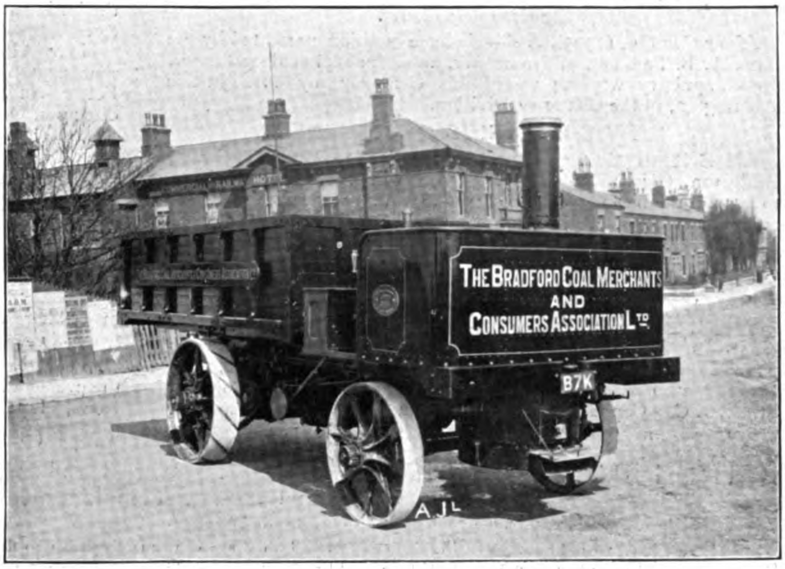
WITH a view to further developing the facilities for the training of chauffeurs, as well as for providing instruction to students preparing to become motor car engineers, the Governing Body have, we are informed, just ordered from Messrs. Clarkson a "Chelmsford" chassis of the second size steam omnibus, which will be so arranged as to afford every facility for experiments, and for use by students.

The Governors are also arranging for an extension of the motor shed to provide room for this chassis and other apparatus, and further accommodation for the classes in motor work.

During the present term, 57 students are in attendance for evening classes and 11 for day classes, the places all being filled up during the first week of the term. Next term commences on Thursday, April 5th, 1906.

An Unjustifiable Scheme.

IT appears that the project of the London County Council, with which the Middlesex County Council has now identified itself, of running trams up what we might really call the motor 'bus road to Cricklewood, is to be persisted with. We have already explained how unjustifiable this project is, the route being more than adequately served already by motor 'buses, and how it has appeared to us to be a distinct attempt to interfere, at the cost of the ratepayer, with motor 'bus traffic. Under the circumstances it is therefore to be hoped that strenuous opposition will be offered to the Bill, both in its initial stages and in its passage through Parliament, if it should ever get there.



One of the Lancashire Steam Wagon Company's Tipping Wagons.—A load of 5 tons can be carried on this vehicle, and by means of a special engine-driven gear, the body can be quickly tilted up and the whole contents of the body shot out behind. As this tipping gear is entirely self-sustaining in any position, the wagon may be moved to clear the load with the body still inclined. Ten of these useful vehicles are on order for the Chelsea Borough Council, and the first of them is on view at the Agricultural Hall Show, opening to-day (Saturday).

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MOTOR CYCLING.

Land's End to John o'Groats Trial.

THE first list of entries has now been published of this important fixture, to be held under the auspices of the Auto Cycle Club in June. These entries total to over 30, and include the following:—

Quadrant Cycle Company, 2 carettes and 3 bicycles; Basil W. Crump, 1 Minerva bicycle; South British Trading Co., 1 Vindex bicycle; Phœnix Motors, 1 Phœnix quadcar; H. Gillard Cove, 1 bicycle; Werner Motors, 1 tricar and 2 bicycles; E. S. Barnfather, 1 Burke bicycle; P. C. Campariole, 1 bicycle; H. Goodswin, 1 Crownfield bicycle; M. J. Tuchmann, 1 Quadrant bicycle; W. Pratt, 1 Ashford bicycle; H. Fear, 1 Ashford tricar; Basil H. Davies, 1 bicycle; J. Maclean, 1 bicycle; J. Tassell, 1 Matchless bicycle; T. Neil Gray, 1 N.S.U. bicycle; E. W. Ashworth, 1 bicycle; Zenith Motor Co., 1 Zenith bicar; E. S. Henderson, 1 bicycle; Triumph Cycle Co., 2 Triumph bicycles; Dr. G. H. Seward, 1 tricar; W. E. Brough, 2 bicycles; W. Montgomery, 1 Montgomery sociable.

* * *

PUBLICATIONS RECEIVED.

The Chemistry of Materials of Engineering. By A. H. Sexton. F.C.S., F.I.C. Manchester: The Technical Publishing Co., Ltd., 287, Deansgate.

Catalogues.

Notes on Ignition. The Electric Ignition Co., Ltd. Sparkbrook, Birmingham.

"*Midland*" *and* "*British*" *Motor Tyres*, 1906. The Midland Rubber Co., Ltd. Ryland Street, Birmingham.

COMMERCIAL POINTS.

The Renault Patent.

THE British Empire Motor Trades Alliance advise us that so far only one firm of French motor car manufacturers has signed the special agreement with Messrs. Renault Frères.

REFERRING to Mr. Crombie's paper on tyres—now appearing in our columns—Mr. MacLulich writes pointing out the peculiarities of the Sirdar inner tube, which is designed to avoid liability to being nipped. This tube, which is already familiar to our readers, has a ∩ section when deflated, and it is this which facilitates its insertion without damage.

IN view of the discussion which has arisen concerning the amount and value of the cars produced by purely British manufacturers during the month of January, it is interesting to learn from Clement Talbot, Limited, that from their works in North Kensington they produced and sold £15,000 worth of British Talbots during that month, and it is expected that the average in future will be £20,000 per month. An extension of the Clement Talbot works is now under contemplation which will double their productive capacity.

AT the recent Motor Exhibitions held in Liverpool and Manchester there were, we are informed, in all 216 wheels fitted with Continental tyres, whilst at London, Paris, New York, and Berlin Shows, some 2,499 wheels in all were fitted. The Continental Tyre Company ask us to mention that any enquiries from motorists in the North of England will receive personal attention if addressed to their new warehouse at 255, Deansgate, Manchester.

LIEUT.-COL. MARK MAYHEW has just received delivery of a 22-28-h.p. Crossley car.

IN regard to the comment which has been aroused recently on the subject of lengthy guarantees for cars, we learn that it has been the practice of Messrs. Legros and Knowles to give a guarantee in respect to their Iris cars from the very first. This guarantee is not less than two years, and applies to every Iris car turned out, and not to one special type.

AMONG various orders recently received by the New Arrol-Johnston Car Company, Limited, Paisley, for their 12-15-h.p. char-a-bancs, is a third order from the Fylde Motor Service Company, Limited, Bispham, near Blackpool, for several of this type. The Company are full up with orders, in addition, for the other descriptions of vehicles which they have made their special models.

Bankruptcy Court.

Motor Car Co., (1905), *Ltd.*—Under a petition presented by the Hon. A. B. Bathurst, of Cirencester, an Order was made last week, for compulsory winding up of this Company, by Mr. Justice Warrington, in the Chancery Division.

NEW COMPANIES REGISTERED.

All British Car Company (Limited), McPhail Street, Bridgeton, Glasgow.—Capital, £250,000 in £1 shares. Objects, to acquire the business of Johnston and Co., engineers and motor car manufacturers, of Bridgeton, Glasgow. First directors, A. L. Drysdale, T. Dunlop, G. Johnston, G. Macmillan, the Hon. Neil Primrose, and Sir Henry White.

Automobile Omnibuses (Limited), 18, Fleet Street, E.C.—Capital, £1,000 in £1 shares.

W. C. Birney (Limited).—March 6. Capital, £3,000 in £1 shares. Object, to acquire the business of cycle and motor components dealer of W. C. Birney, at 6 and 7, Blackfriars Road, S.E.

Improved Electric Traction (Limited), 60, Coleman Street, E.C.—Capital, £15,000 in £1 shares. Object, to carry on the business of proprietors and manufacturers of motors, motor cars, &c.

New Alphabetic Press (Limited).—Capital, £1,000 in £1 shares. Object, to take over the business lately carried at 30, Fetter Lane, E.C., as the "British Motor Tourists' ABC." First directors, O. A. Fry and F. P. Elkington.

Pryce Trow (Limited).—Capital, £1,000 in £5 shares. Object, to take over the business of Pryce Trow, of a cycle and motor car manufacturer, at 55, Oxford Street and Harbour Road, Swansea. First directors, Mrs. E. J. Trow, C. Trow, and W. Trow.

Reliance Motor Transit Company (Limited), 9, Wool Exchange, E.C.—Capital, £25,000 in £1 shares.

Westminster Motor Works (Limited).—Capital, £1,000 in £1 shares.

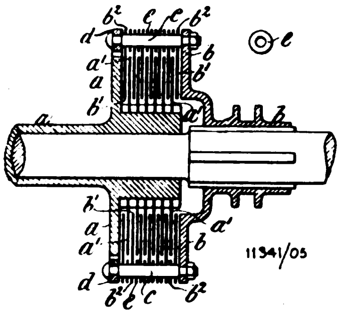
Wretham Cycle Company (Limited), Hamstead Road, Handsworth.—Capital, £500 in £1 shares. Object, to take over the cycle and motor cycle business of W. C. Lloyd at Wreatham Road, Handsworth, Staffordshire.

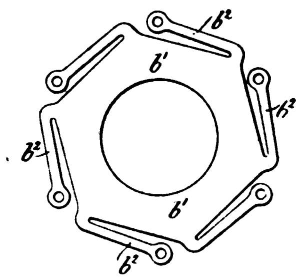
⊗ ⊗ ⊗ ⊗

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

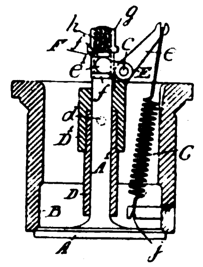
The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

11841. 30th May, 1905. Improvements in Friction Clutches. Sir W. G. Armstrong, Whitworth and Co., Ltd., and Walter G. Wilson, Elswick Works, Newcastle-on-Tyne. This invention relates to what are known as disc-clutches, *i.e.*, clutches which consist of a number of parallel plates or discs, alternate plates being fixed respectively to the two moving parts, all the plates being pressed together when the clutch is put into action, and the object of the invention is to prevent the plates from binding together. For this purpose the plates of either one or both series are made in one piece with spring arms, which project from them, preferably in a more or less tangential direction, the rods supporting the plates passing through the ends of the arms. There are two figures. Fig. 1 is a longitudinal section of the clutch and Fig 2 is a detached view of one of the plates, b^1, with its arms, b^2, a and b are the two moving parts, and a^1, b^1 are the plates carried by them respectively. These plates are only shown diagrammatically in Fig. 1; they are very thin and numerous. The plates, a^1, are attached in any ordinary manner. The arms, b^2, of the plates, b^1, are carried by bolts, c, which pass through them, their ends being secured to b and to small discs, d. The plates, b^1, are separated by washers, e, which are preferably very slightly thicker than the plates, a^1.—February 28th, 1906.





14094. 8th July, 1905. Improvements in or relating to Self-acting Induction Valves for internal Combustion Engines and generally for use with Elastic Fluids. The Wolseley Tool and Motor Car Company, Limited, Adderley Park, Birmingham, and Louis Silverman, Crayford Works, Crayford, Kent. Self-acting induction valves of internal combustion engines, as usually employed, require a greater suction to keep them open than to move them from their seats, if the seating is dry and there is no oil on it, and they are consequently liable to flutter on their seats during the suction stroke, causing noise and interfering with the regular flow of the gaseous mixture, thereby preventing the proper charge from being drawn through. The object of this invention is to obviate these defects. There are four figures. Fig. 1 is a section. The force of a spring which presses the valve against its seat is transmitted to the valve through the medium of an L-lever, which is mounted, and is connected with the valve and spring in a manner which ensures that as the valve is moved from off its seat the leverage through which the force of the spring is transmitted to the valve is reduced, and the effective force of the spring tending to close the valve is lessened. A is the valve, A^1 the valve-stem, B the valve-seating, and D D^1 the guide for the valve stem. E is an L-lever, which is pivoted between ears formed on the upper end of the upper portion, D^1, of the guide, such portion of the guide being made, for convenience of forming the ears therewith and fitting them to receive the pivot-pin, c, and the lever, E, separate from the portion D. The part D^1 may be prevented from turning on the part D by a pin, d. The lever, E, has a longer arm, e, which runs in an inclined direction, and a shorter arm, e^1, which engages with the valve-stem, A^1. The engagement of the arm, e^1, with the stem is shown through the medium of a sleeve, F, which is passed over the outer end of the stem and secured between the shoulder of the stem and a nut, g, which is screwed upon the end of the stem, and is itself secured by a transverse pin, h. The outer ends of the two sides of the arm, e^1, operate between a pair of ledges, f, which project at each side of the sleeve. A spiral spring, G, which is under the required tension when the valve is closed to ensure the desired pressure of the valve against its seat, connects between a fixed point, j, within the valve-seating and the outer end of the longer arm, e, of the L-lever, E, and the line of pull of this spring is at an acute angle with the longitudinal axis of the arm, e. As the valve opens under the influence of the suction, the angle between the line of pull of the spring, G, and the longitudinal axis of the arm becomes more and more acute, and thus the leverage through which the spring acts in relation to the valve decreases as the valve opens.—February 28th, 1906.



Patent Specifications Published.

Applied for in 1905.

Published March 15th, 1906.

4,532.	E. FIELD AND F. S. MORRIS. Intl. combn. engines.
6,010.	E. S. BOND. Air-cooled intl. combn. engines.
6,674.	S. L. B. DAVIS. Intl. combn. engines.
9,603.	E. L. MULLER. Vaporisers.
10,272.	J. BIGGS. Motor road vehicles.
10,407.	E. J. HODGSON. Recording apparatus.
10,968.	H. WALKER, G. S. ALEXANDER, AND S. KING. Variable speed gear.
11,247.	H. DU CROS AND C. T. B. SANGSTER. Motor-driven vehicles.
11,341.	SIR W. G. ARMSTRONG, WHITWORTH AND CO., LTD., AND W. G. WILSON. Friction clutches.
11,637.	C. A. AND F. J. MILLER. Oil lamps.
11,664.	J. S. MILLINGTON. Starting handle.
11,778.	D. REID. Exhaust Mufflers.
11,820.	C. NIELSEN. Valves for pneumatic tyres and pumps.
11,965.	E. STERNE. Anti-skid device.
13,315.	J. B. BROOKS AND J. HOLT. Anti-skidding devices.
14,077.	G. PILKINGTON. Lamp brackets.
14,094.	WOLSELEY MOTOR CAR CO. AND L. SILVERMAN. Self-acting induction valves.
15,737.	SOC. PANHARD AND LEVASSOR. Interlocking mechanism for change-speed-gears.
17,829.	T. OLDFIELD AND J. A. SCHOFIELD. Resilient wheels.
20,073.	O N. RIKOF. Speed indicating and recording apparatus.
21,812.	M. FISCHER AND A. HOMMEL. Friction disc driving gear.
22,724.	L. KRIEGER AND CIE. Regulating speed of electric motor cars
23,132.	F. R. SIMMS AND R. BOSCH. Magneto electric ignition apparatus.
23,142.	L. M. G. DELAUNAY-BELLEVILLE. Lubricating pumps.
24,211.	P. RILEY. Driving and differential gearing and driving axles.
24.781.	T. S. H. CRAIG. Device for detecting punctures in pneumatic tyres.
25,169.	L. KRIEGER AND CIE. Controlling switch of electric vehicles.
25,636.	V. FAUS. Pneumatic wheel-tyres.

Published March 22nd, 1906.

1,601.	H. SPURRIER. Wheels.
3,910.	H. HUMPHREYS. Variable speed gear.
4,181.	THE NORDYKE AND MARMON CO. Running gear.
4,558.	B. A. L. SAVILE. Bodies.
4,828.	A. DUTRIEUX-LAMELIN. Tyres.
7,949.	F. W. LANCHESTER. Mechanically-propelled road vehicles.
8,337.	G. H. WARD. Apron for riders.
8,639.	J. BYROM. "V" driving belts for motor cycles.
9,228.	R. H. MCHARDY. Motor-driven auxiliary wheel for pedal-propelled cycles.
9,525.	F. HARGREAVES AND T. H. H. WHITEHEAD. Friction clutches.
9,563.	J. W. HARTLEY. Friction clutches.
10,104.	L. BEAUDOIN. Cooling apparatus.
11,636.	J. A. FLEWITT. Motor bodies.
11,768.	S. H. N. AND A. J. BONE. Spring wheels.
12,531.	L. ZEIDLER. Free-wheel hubs for motor cycles.
12,679.	E. LEHMANN. Means for varying the lift of valves.
12,889.	J. H. HAMILTON. Stuffing boxes for intl. combn. engines.
13.261.	F. L. MARTINEAU. Carburettor.
14,088.	J. MELOTTE. Transmission systems.
14,375.	J. FLETCHER. Brakes.
20,748.	W. WHITMORE AND G. ALLEN. Pneumatic tyre.
21,161.	DOBELLI SPARTACO. Intl. combn. engines.
25,170.	KRIEGER AND CO. Self-propelled vehicles.
25,278.	J. SLEE. Resilient wheels.

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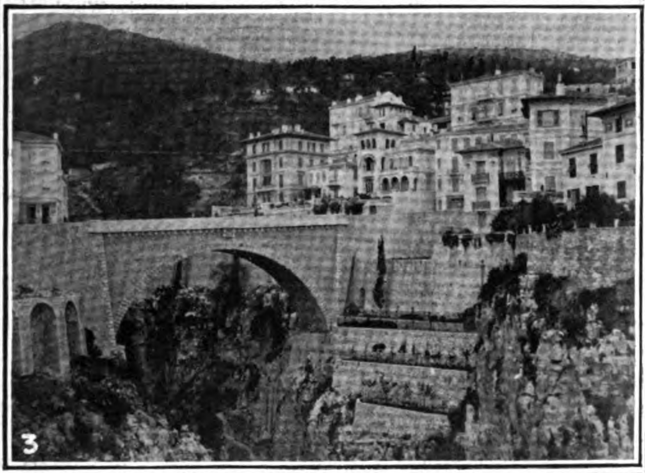

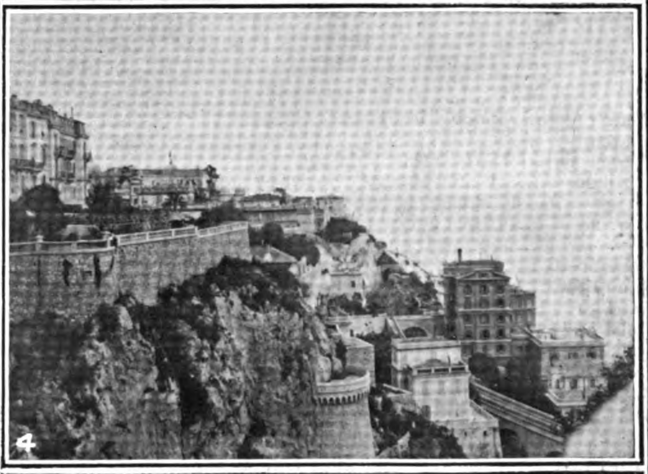

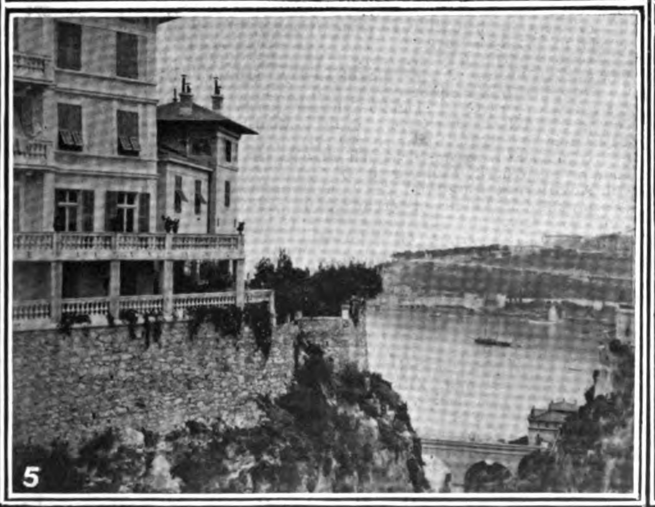

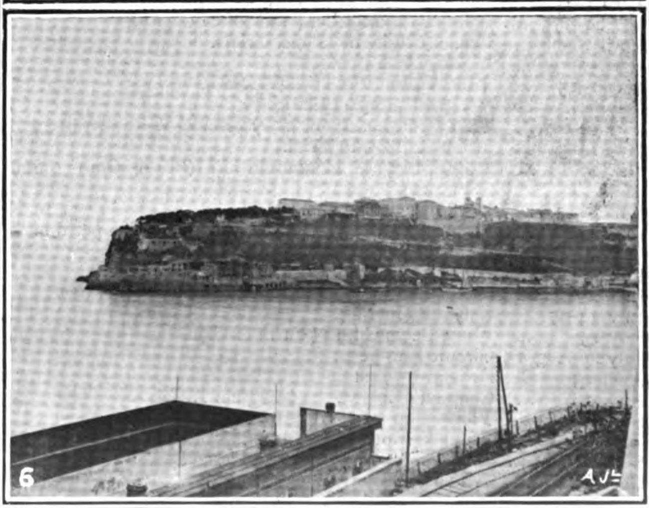

1. Looking towards the Casino. 2. View from the steps of the Casino.
3. Typical view of Monte Carlo. 4. Scene from the bridge in No. 3.
5. Looking across the bay—Monaco in the distance. 6. Monaco from Monte Carlo Railway Station.

MONTE CARLO AND MONACO, WHERE THE MOTOR BOAT EXHIBITION AND MEETING COMMENCE ON APRIL 1.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C, by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

March	*4,000 Miles Tyre Trials.
March	*Lamp Trials.
March	*Speedometer Trials.
April 26	"Lubrication." Paper by Mr. J. W. G. Brooker (Auto-Cycle Club).
May 24	Frome's Hill Climb (Herefordshire A.C.).
May 26	Motor Union Meeting (Birmingham).
June 11–16	Land's End to John O'Groat's (Auto Cycle Club).
June 13–16	Scottish Reliability Trial.
June 30	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July	Motor Yacht Club Reliability Trials.
July 21	Motor Union Meeting (Bath).
Aug.	*Van Trials.
Sept. 22	Motor Union Meeting (York).
Sept. 27	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

April 1–15	Monaco Motor Boat Exhibition and Races.
April 1–17	Budapest Exhibition (A.C. of Hungary).
April 18–26	French Resilient Wheel Trials.
April–May	Milan Exhibition.
May 1–15	Paris Voiturettes Trial (*L'Auto*).
May 6	"Targa" Florio (Sicily).
May 12–24	Tour de France (Motor Cycles and Voiturettes).
May 14–31	Milan Reliability Trial.
May 27	Motor Bicycle Championship (Moto Club de France).
June 6–13	Herkomer Cup.
June 17	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 28–29	Kiel Motor Boat Races.
June 29	Motor Bicycle International Cup Race (Austria).
July 14–17	Ostende Meeting.
July 15	Mont Cenis Climb (Turin A.C.).
July 26–Aug. 15	Circuit Européen.
Aug. 13	Ardennes Circuit.
Aug. 18	Coupe de Liedekerke (Belgium A.C.).
Sept. 10	Florio Cup Race (Italy).
Sept. 15–16	Mont Ventoux Hill-Climb.
Sept. 20	Lake Major Motor Boat Races.
Oct. 5–14	Leipzig Exhibition.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

Chariot Racing in Motor 'Buses.

There can be no doubt that the dangerous pastime of motor 'bus racing on important routes is regularly increasing. It will certainly not benefit the automobile 'bus industry if the coming of these 'buses is generally to mean that our principal thoroughfares are to be the scene of frequent point to point racing between enthusiastic drivers with five tons of motor 'bus and a couple of tons of passengers behind each of them. It was, as we have pointed out long ago, bad enough with the old horsed omnibus. It is infinitely worse with the motor-driven colossus that is replacing it. It is becoming a serious public danger, not only to the portion of the public which is on or inside the 'buses, but to all who are using the streets in other vehicles or are proceeding on foot. We are glad to see that there are signs that the police, whose attention THE AUTOMOTOR JOURNAL some time ago called to the dangers of the situation, are prepared to do their duty, and that London magistrates—we do not refer to any particular magistrate or any particular case—are prepared to back them up. Let us hope that these two branches of our Executive in the Metropolis may soon succeed in making motor 'bus racing too expensive a pastime to be indulged in by any but those who have sufficient funds at their disposal to enable them to enjoy the delights of unlimited speed on the Ormonde Daytona Beach or some similar recognised speed-course.

◆ ◆ ◆

The General Press on the Question.

We are also gratified to note that the general daily Press is taking a very strong and sensible line on the question, and has pointed out the dangers involved in this reprehensible absurdity in terms as strong as we ourselves used when first dealing with it many months ago. At the same time, we think both Press and Magistrates should recognise that it is not in most cases really the drivers who are primarily to blame. Those who imagine that drivers of motor 'buses engage in these point to point steeplechases on their own initiative are mistaking the situation. As we observed when first dealing with the question, the evil is the result of the silly policy adopted by the old-established 'bus companies towards new rivals of attempting, in their own language, "to run their rivals off the road." This, as we have fully explained, is accomplished by a system of "nursing," and the officials of the Company are in general on the look out to see that of their two 'buses told off usually to nurse a single rival, one, at any rate, arrives at the principal points of the route first. That the men really, under these circumstances, pay the fines is highly unlikely. The whole thing results from a discreditable method of meeting competition. The sensible laws against unfair trade competition which exist in Germany would render it impossible from the start. If fines prove ineffective, it is probable that magistrates would proceed to inflict imprisonment on the drivers, which would be a rather drastic procedure, especially when we consider that, as pointed out above, they are probably only partly to blame. But the safety of the public and the prospects of the motor 'bus industry certainly demand that the practice must cease, and we are glad to see that there is a strong magisterial tendency to take a proper line.

The Anticipated Canal Boom.

The attitude of the Government to the canal question, and the attention which the successful tour of the "Duchess" has concentrated upon canal navigation and its future, are regarded in some quarters as presaging a regular boom in canal property. This, at any rate, is the opinion of Mr. Horatio Bottomley, M.P., of whom many of our readers have doubtless heard, expressed at a recent extraordinary general meeting of the Joint Stock Trust and Finance Corporation, of which he is chairman. It is this body, it appears, who have become, through an intermediary, the proprietors of the Woking, Aldershot, and Basingstoke Canal, and Mr. Bottomley, whose temperament is sanguine, flourished that waterway (metaphorically, of course) before the eyes of his shareholders, if not as a valuable asset at the present moment, as one that would certainly become so in the near future when canals will be looked upon as liquid gold mines, and the general question that everybody will be asking everybody in the City will be, "Have you got a canal?" We have in the past made suggestions in regard to rejuvenating this canal, which Mr. Bottomley admits is at present, at any rate, semi-derelict. These referred in general to the income that might be derived by deepening the locks, diminishing their number, and arranging the whole canal with suitable hotels and restaurants as a run for motor boats, both pleasure and commercial. From Mr. Bottomley's speech we are disposed to gather that he means to keep the canal until he can sell it at a better price. The alternative which we have suggested of spending a little money on it, and making it pay, might be considered by him in the meantime as worth attention.

◆ ◆ ◆

The Sporting Side—More Backing Required.

If representative British automobilists and motor boatists are to make what the Americans term "an effective showing" on the Continent—even, we may perhaps add, in the United States—it is absolutely essential that they should be fully and adequately backed up by the ruling automobile authority of this country. The irritating habit of not always running international events exactly in accordance with the rules drawn up for their management prevails to a certain extent, we are reluctantly compelled to admit, on the other side of the Channel. How far such departures from rule are intentional or not it would be invidious to inquire too closely, but that British competitors have on several occasions been the victims admits of no possible doubt. It is, therefore, with satisfaction that we learn that the Automobile Club has unanimously adopted the following resolutions :—

(*a*) That in view of the fact that the club has had before it this evening information that the rules governing certain foreign automobile competitions have not been carried out, it be an instruction to the secretary in the case of each foreign automobile competition of an international character to write to the British entrants on their return, and ask them if the rules have been carried out to their satisfaction.

(*b*) That the committee appoint one or more representatives to attend every such foreign competition to look after the interests of British entrants if the club has no official representation on the committee of management, and that this be referred to the competitions committee to carry into effect.

On these the club may, we feel convinced, be trusted in future to act with resolution and decision, so that the British competitors in International events will feel, if anything has occurred which may strike them as unfairly affecting their interests, that their protests will not be the mere expressions of individuals, but will have behind them the weight, authority and the energetic representation of the Automobile Club of this country.

Motor Car Services in Relation to Tramways.

The instructive and suggestive paper read on Tuesday evening, before the Tramways and Light Railways Association, by Mr. Norman D. Macdonald, should serve to throw a great deal of oil on the troubled waters of contemporary discussion by convincing everyone that, in spite of existing circumstances, friendly co-operation between the electric tram and the motor 'bus to the general public advantage is not only possible but easy. Mr. Macdonald has made a very special study of the traction problem in a variety of places (as he says, "from Moscow to Chicago") and in all its phases, while some seven years ago he attempted to introduce into his native city of Edinburgh an automobile passenger service. In general, Mr. Macdonald recommends municipal authorities, or any other body or corporation owning electric tramway services, to recognise that as the tramway service is open to the competition of the motor 'bus, they should do the competing themselves. He proposes that motor 'bus services should be used in the first place as feeders to bring in passengers from longer distances out to the tramway starting points. At the same time he recognises the advantage to the passenger who has once got upon a motor 'bus of being able to proceed right to his place of business without getting down and mounting a tram, so he would further recommend the local bodies who own the trams to run parallel services (at any rate, during the rush-time of the day) of motor 'buses to compete for long distance traffic with their own trams by bringing in passengers from further afield, and setting them down practically at their places of business without making frequent stoppages on the way. There is much in this recommendation. To compete with yourself, where you have reason to believe that if you do not do so somebody else will, is frequently sound policy, for you know that you can always keep your own competition friendly and by starting such a competition you, at any rate, considerably discount, as in the present instance, the chances of outside enterprise competing successfully. It is of course true that many local authorities possess powers which would enable them to veto competitive motor 'bus services. But Parliament is not likely long to put up with a state of affairs in which local authorities systematically use their powers to prevent private enterprise from providing their citizens with adequate means of locomotion while, at the same time, they refuse to provide it themselves. We certainly think, therefore, that Mr. Macdonald is a wise counsellor of the various local bodies who are in the position to take his advice. The attitude he adopted, too, as friendly counsellor, enabled him to point out without reserve to a body which might, to a certain extent, be regarded as antagonistic, the many advantages of the motor 'bus for coping with certain traffic conditions in a way he would not otherwise have been able to do.

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Power Rating of Petrol Engines.

A convenient and readily applicable method of rating the horse-power of petrol engines still remains a desideratum, most of the methods hitherto employed being open to considerable objection. Naturally, the Automobile Club is desirous of having the ambiguities affecting the question cleared up in the minds of thinking motorists, and equally naturally, in his perplexity, the secretary applied to Mr. Dugald Clerk to do so, the result being the very valuable paper from that eminent authority which we reproduce on another page. Mr. Clerk's paper might be summed up briefly by the statement that, in his view, none of the methods now in vogue with manufacturers are satisfactory, and he particularly pointed out the futility of attempting to rate internal combustion engines merely by cylinder dimensions, as has been frequently suggested and sometimes adopted for club events. The full arguments against adopting this latter course have been dealt with at length in prior numbers of THE AUTOMOTOR JOURNAL, both when discussing the rules for the Tourist Trophy and in connection with the rating of engine power for motor boats. It is thus particularly satisfactory—and tends to clarify the situation—that Mr. Dugald Clerk should have given this quietus to all proposed formulæ for calculating horse-power from mere cylinder dimensions, and we cannot but think that, from this point of view alone, his paper will do much to bring the merits of the Tourist Trophy type of contest home to the motoring public.

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What is Actually Required.

It is, of course, always comparatively easy to say what should not be done, and the problem of rating the horse-power of automobile engines—even when bench tests can be made—is no exception to this rule. It is not so easy to see how the difficulties can be got over. What the public—that is to say, the automobile public—and the manufacturer alike want to know is, after all, what power the engine can develop continuously when it is running at its most satisfactory speed under ordinary conditions of working. Everyone realises that there are speeds above and even below which an engine does not work regularly or smoothly, that, in fact, every engine has its most comfortable speed—whether we can or cannot at present term this its "normal" speed—at which approximately it is certainly pleasantest to run it. This "normal" speed is usually below—sometimes much below—that at which the engine is capable of giving its highest horse-power, while to further complicate matters different engines have vastly different "normal" speeds. It is, therefore, no real guide to know that a certain engine gives a certain horse-power at a certain speed, unless it is also known that that speed is the "normal" speed of that particular engine. If some generally-accepted and easily-applied definition as to what constitutes this speed could be arrived at, a uniform and comprehensible rating could be established amongst manufacturers of petrol engines. Their ordinary bench tests would then enable them firstly to ascertain what the "normal" speed really was, and then the maximum power obtained on the test-bench at that speed would constitute *the* b.h.p. of that particular type of engine as supplied to the public, with its own standard carburettor, standard ignition apparatus, and exhaust-box.

One suggestion that was brought forward during the discussion was that the normal speed should be determined by the efficiency, the idea being that the most comfortable speed for any engine—when fully loaded—would be that at which least power was being lost in doing useless "work." On this basis, the normal speed would be ascertained by measuring the maximum b.h.p. and the fuel consumption at each and every speed, and then selecting that speed at which the fuel consumption per b.h.p. was lowest. Another possible method indicated by Mr. Dugald Clerk was that of fixing upon the speed at which the engine could give the maximum b.h.p. continuously for a period of at least five hours, with the cooling water leaving the jackets at a temperature of not less than 70° Cent.

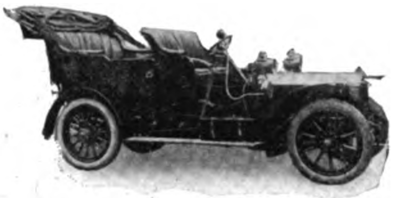
How to Recognise the Cars of To-day.

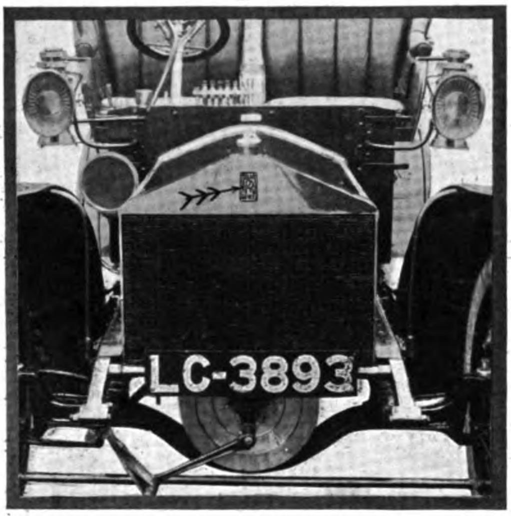
(No. 15).

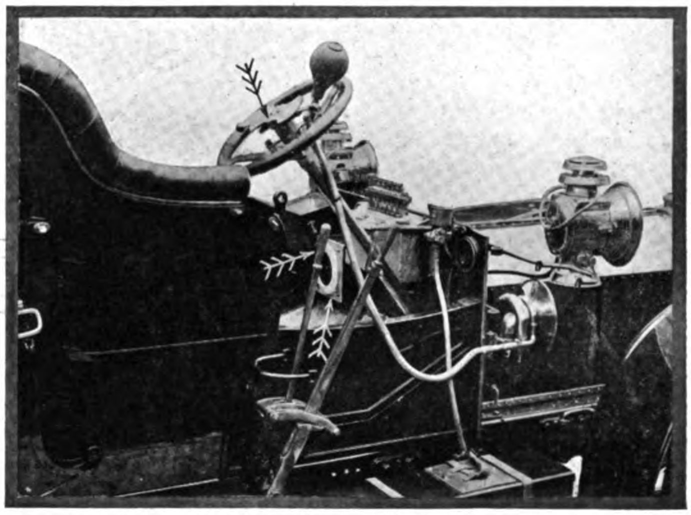
The Rolls-Royce

(BRITISH)

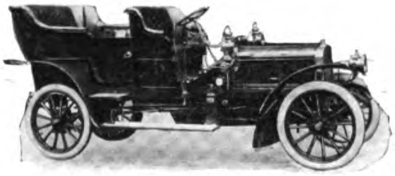
20 & 30 H.P.







From in front the RECTANGULAR RADIATOR, surmounted by its TRIANGULAR TANK, is very noticeable, and in addition there is a SMALL BADGE bearing the R.-R. MONOGRAM in the middle of the tank. Other distinctive details are the CONTROL LEVERS, which are partly covered by a brass plate, above the wheel, and the rectangular glass-faced COMMUTATOR CASE on the dash

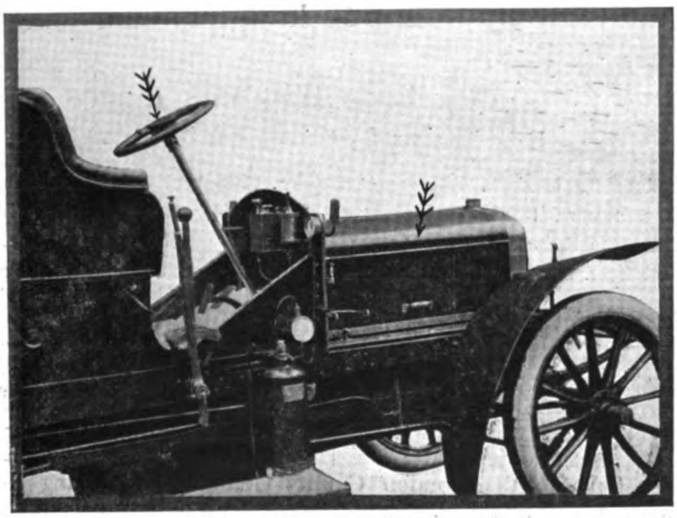


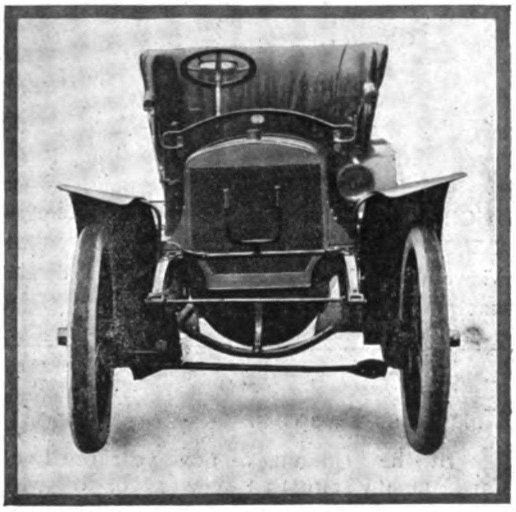
(No. 16).

The Thornycroft

(BRITISH)

14, 26, & 36 H.P.



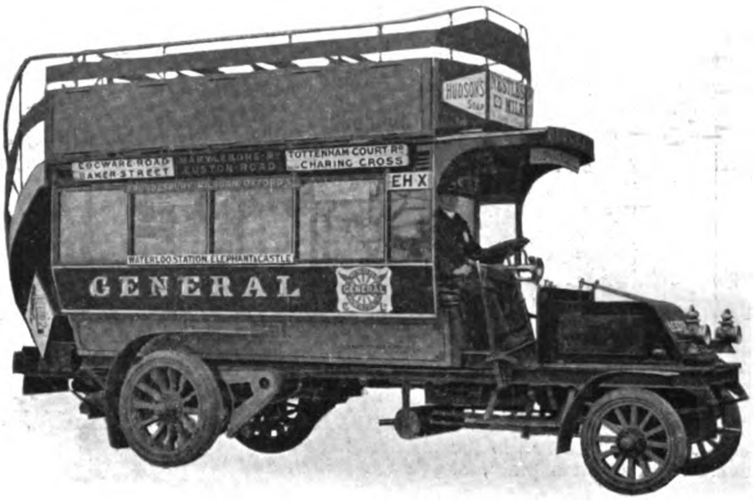


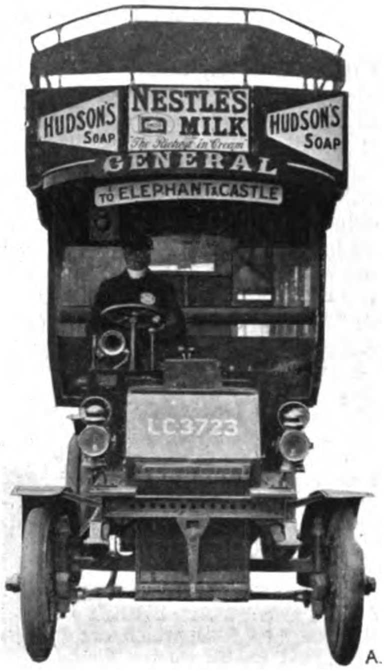
Above the Steering Wheel is an oblong box carrying the CONTROL LEVERS, and this forms one of the most prominent features of these Cars. The RADIATOR, too, is very characteristic, as is the BONNET, which is easily recognised by the rows of RIVET HEADS.

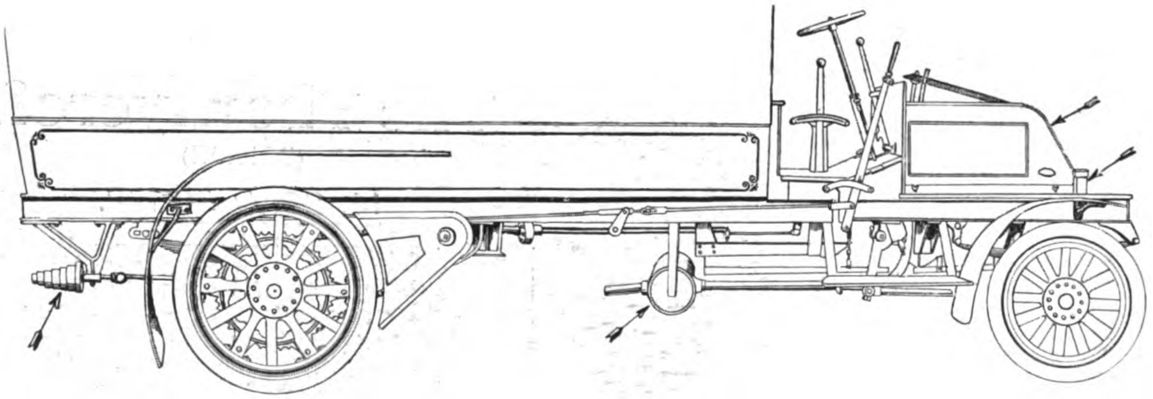
How to Recognise the Motor 'Buses of To-day.

(No. 2).

Straker-Squire
(BRITISH)
AND
Büssing
(GERMAN).


HUDSON'S SOAP
NESTLE'S MILK
GENERAL
WATERLOO STATION ELEPHANT & CASTLE
TOTTENHAM COURT RD CHARING CROSS
EUSTON ROAD
EHX





The Büssing vehicles are now also made in England by Messrs. Straker & Squire. Most of them have an INCLINED FRONT TO THE BONNET, but some have a square front. In both types, however, the RADIATOR IS BELOW THE FRAME. The VOLUTE SPRING AT THE REAR is a unique as well as a very noticeable feature. Viewed from the side, another prominent detail is the EXHAUST BOX, which occupies an isolated position beneath the centre of the frame.

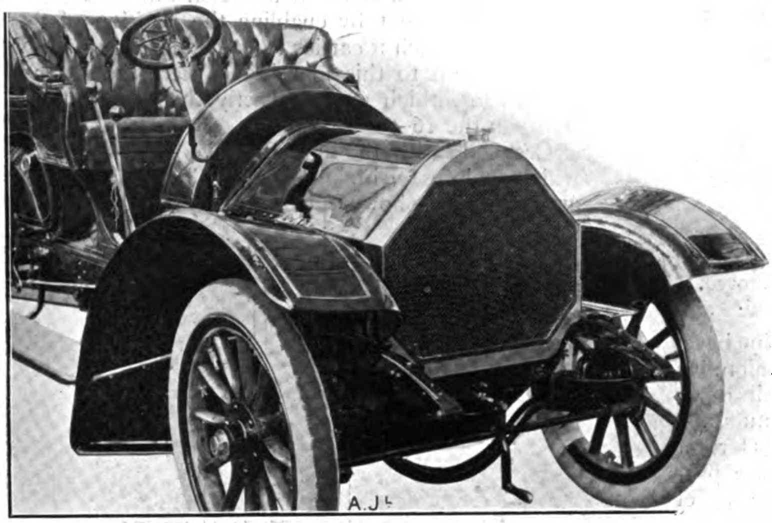
Motor 'Bus Prospects.

By the beginning of next year the London Road Car Company state that they expect to have 261 motor 'buses running. This announcement was made at a meeting of the company held last week to authorise the issue of £200,000 of capital for procuring more motor 'buses. Mr. Evans, a shareholder, saw danger ahead, and endeavoured to move an amendment, but was ruled out of order. Mr. Evans pointed out that, owing to the powers the London County Council were asking for under their Bill, it was possible that in future facilities might be given for obtaining electricity in bulk, and, therefore, electric cars would supersede petrol cars.

THE HUMBER PETROL CARS.

FOUR AND SIX-CYLINDER MODELS.

(*Continued from page* 346.)



The 16-20-h.p. Humber Car. View of the front portion of the complete car, showing the neat radiator—which is composed of flat corrugated tubes—the hooded dash and the distinctive one-arm steering wheel.

The 30-40-h.p. Back Axles.

IN general design the back-axle on the new 6-cylinder car—which has just made its appearance as an additional *model de luxe* to supplement the standard and popular 4-cylinder car—is similar to that on the 16-20-h.p. vehicle, but it has two important features which are not found on that smaller model. There is a spring-drive and also a foot-brake on the differential box, inside the axle casing. Of these parts, we have taken special photographs, Figs. 7 and 9, which show the modifications in detail, and these, together with the line drawing in Fig. 8 and the illustrations of the standard 4-cylinder model published last week, render the entire design of this new back-axle quite clear without any lengthy explanation.

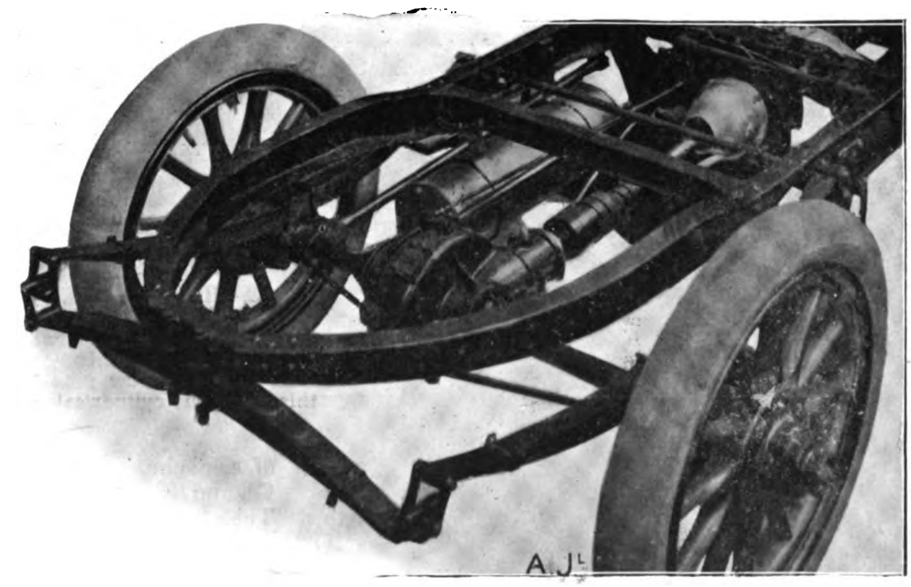


Fig. 6.—The 30-40-h.p. Humber Car. View of the back-axle and rear portion of the frame on the new six-cylinder model. The frame is raised just behind the transverse member, and the sides converge to a point at the rear where they are attached to the transverse spring.

Of the three illustrations referred to, the line drawing, Fig. 8, gives, perhaps, the best idea of what alterations have been made in order to embody the spring drive, and it will be noticed that the addition of the foot-brake has involved practically no further modification in the general design whatever. Comparing Fig. 8 with Fig. 5, the difference in detail is at once apparent, it having been emphasised by showing the new member in solid black. Surrounding the differential box, D, is a cylindrical casting, D^7. This new member is more clearly illustrated in Fig. 9, where the various component parts of the central portion of the back axle are shown separately. It will be noticed that the inner surface of the casting, D^7, has alternate recesses and projecting jaws which coincide with similar formations on the flange of the differential box, D. It is only one-half of the box, D, which has been modified in this way, and, as Fig. 9 clearly shows, the other half has not been altered from the standard design in any respect. When the various members are assembled, eight small springs, D^8, are placed in the recesses formed in the castings, and these springs—which are shown in place in the upper view of Fig. 9—form the only connection between the differential box, D, and the casting, D^7; if they were not there the two members could, therefore, revolve quite independently. It is to the casting, D^7, that the large bevel wheel, D^1, is fixed, and consequently it is through the springs, D^8, that all the power is transmitted to the road wheels. These springs are not at all large, and, in fact, there is nothing in the appearance of the finished axle to indicate that any special device of the kind has been embodied. They have sufficient range, however, to enable the engine to make three-quarters of a revolution before the road wheels need begin to move, and it is just such small allowances as these which make all the difference between harshness and softness in starting and running a car. Taken in conjunction with a 6-cylinder engine and a special dash-pot clutch mechanism, the spring-drive should add the finishing touch to a chassis built as a *model de luxe* such as is this.

In the differential gear itself there has been no change,

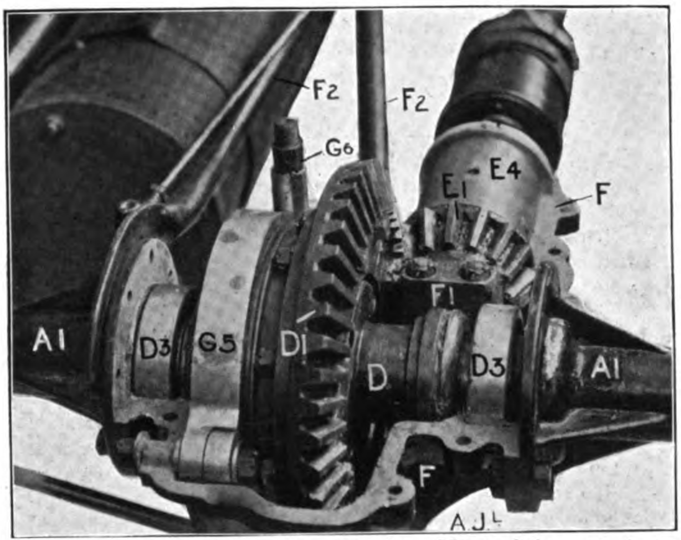


Fig. 7.—The 30–40-h.p. Humber Car. View of the central part of the back-axle after the casing has been removed. The enclosed foot-brake, G^5, is very prominent.

nor in the arrangement of the bearings for the driving bevel spindle, E. Enclosing the bearings behind the pinion, E^1, is a sleeve, E^4, which is provided with a dust-cap at its outer end. This sleeve is not divided, and when the nuts, E^5, are locked in position, the spindle and its bearings form a compound unit. Thrust-bearings, E^3 and D^4, are provided to take the end pressure set up by the bevel wheels, E^1 and D^1, respectively.

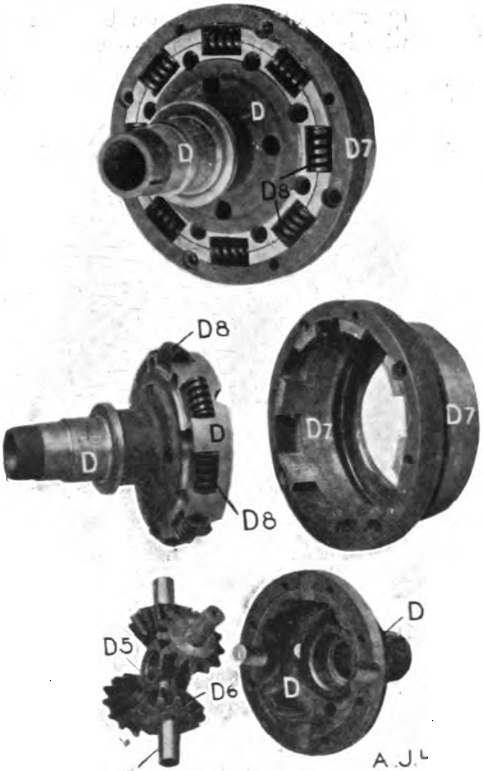


Fig. 9.—The 30–40-h.p. Humber Car. Views of the "spring-drive" mechanism showing, above, the various members assembled, and the springs, D^8, in place. Beneath, the main elements, including the differential pinions on their spider, are shown separately.

The Rear-Axle Brakes.

Having a superfluous surface on the exterior of the casting, D^7, in the 6-cylinder model, it was an obvious step to convert it into a brake-drum, since the brake-shoes, G^5,—which are shown in Fig. 7—involve no further complication of importance. This brake is operated by foot, and the rod from the pedal is attached to the vertical spindle, G^6, which directly acts upon the brake-shoes. There are renewable cast-iron liners on the shoes, G^5, and the end of the spindle, G^6, has a hexagonal section which affords a coarse adjustment by enabling the position of the small lever which it carries to be changed.

In addition to this foot brake, there are the two hub brakes, which are of exactly the same type as those on the 16–20-h.p. model.

Cast solid with the hub, B, is the brake-drum, B^4, which encloses the brake-shoes, G. These brake-shoes are very clearly shown in Fig. 4; they consist of a pair of semi-circular castings, which are hinged together at G^4, and are supported by the stationary bracket, A^8. Their free ends are drawn together by a spring, G^3, so that they rest against an oval-shaped cam, G^1. This cam is connected to the arm, G^2, and, when the side lever is operated in order to apply the brakes, it is rocked round so as to force the two brake-shoes apart against the drum. When the side lever is drawn back, the brake is automatically released by the action of the spring, G^3.

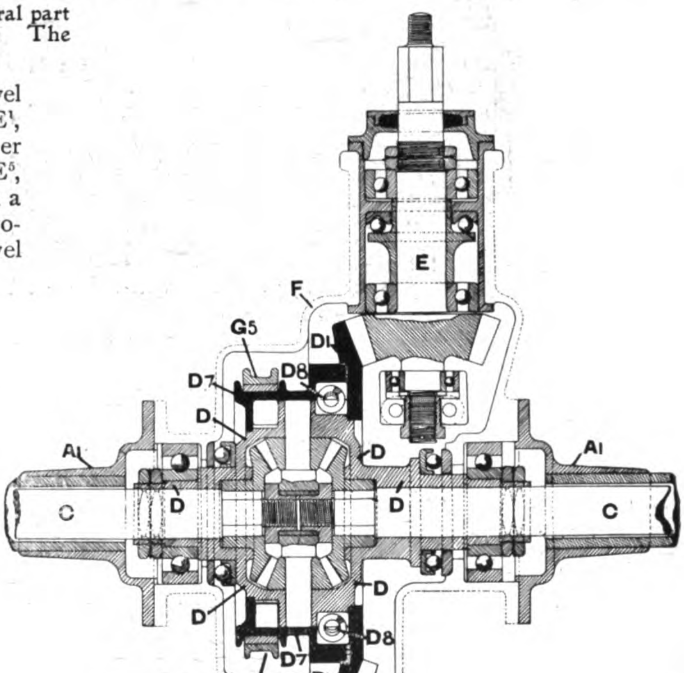


Fig. 8.—The 30–40-h.p. Humber Car. Sectional drawing showing the position of the spring drive, D^8. Comparing this drawing with Fig. 5 shows what modifications in design have been necessary to embody the new features. It will be noticed that only one new member has been necessarily introduced, this being the cylindrical casing, D^7, which is shown in black.

(*To be continued.*)

THE CRITCHLEY-NORRIS PETROL 'BUS.

(*Continued from page* 350.)

IN the first portion of this article, which we published last week, all the chief characteristics of this well-designed and, in many respects, original motor 'bus were briefly dealt with, and illustrations were given showing the general arrangement of the complete chassis as well as of the special radiator and the steering-gear. We now continue this article with detailed descriptions of the more unusual portions of the mechanism.

The new Critchley-Norris, Double-deck, Omnibus.

The Radiator.

Figs. 3 and 4 demonstrate the precise manner in which the Critchley-Norris radiator is built up with the special " Kitchen " tubes that have already been referred to. Thus, in the sectional drawings, it will be seen that there is a central water-chamber, H^1, into the sides of which each of the projecting tubes is screwed separately by the threaded collar, H^3. The plain portion, H^2, of each tube lies inside the water tank, H^1, and it is only that portion which is surrounded by the special " Lune Valley " radiator surface, H^4, that is exposed to the atmosphere. In the Critchley-Norris design these tubes are arranged in a sloping position to enable the alcohol that is vaporised inside them to circulate freely and thus impart the heat from the inner ends to the outer ends quickly. The circulating water merely surrounds the plain portions of the tubes, and it is the volatile character of the enclosed spirit which causes the tubes to maintain an equal temperature throughout their length, the spirit boiling at an unusually low temperature owing to the partial vacuum that surrounds it.

It will be noticed that there are four rows of tubes, each comprising about 14 tubes, and that the tubes are so arranged that the air drawn past them by the fan is brought well into contact with every tube. Apart from the advantages of being able to replace a damaged tube without difficulty, and of each being a totally independent unit, this radiator has the further merit that it can be easily cleaned out when necessary, and that no deposits can be formed inside the tubes, as can occur with most ordinary radiators.

The Steering-Gear and Control-Lever.

In the sectional drawing given in Fig. 5, the manner in which the single lever, G, beneath the steering-wheel is utilised for varying the time of ignition as well as for operating the throttle-valve is very clearly shown. This lever is so pivoted to a collar on the central shaft, and is so connected to the outer tube, G^1, that the tube, G^1, can either be moved up and down by it, or can be rotated about its axis—both these motions being entirely independent of one another. For varying the time of ignition, the lever, G, is depressed or drawn up towards the steering-wheel, and in this case the collar, G^2, at the lower end of the tube, G^1, acts direct upon the bell-crank-lever, G^4, which is pivoted at G^3. The lever, G^4, is in turn connected with the timing-gear on the engine, and a positive friction lock is provided by the quadrant, G^5, so that the lever, G, is held in whatever vertical position it may have been placed.

For controlling the throttle-valve, the lever, G, is used as though it were rigidly fixed to the tube G^1, and the tube is thus caused to rotate about its axis. It then carries with it the nut, G^6, with which it engages by means of a feather key, and the rotary motion of the nut, G^6, about the corresponding thread cut for it on the steering spindle, causes the nut to travel upwards or downwards. In this way the lever, which is pivoted at G^7, is rocked about its axis, for this lever engages with a groove at the lower end of the nut, G^6, and it is, of course, this lever that is connected up with the throttle-valve on the engine.

Of the steering-gear itself, comparatively little need be said, for the arrangement of the screw and nut mechanism, by which the shaft, G^8, is rocked about its axis when the steering-wheel is turned, is clearly indicated. Attention should, however, be drawn to the arrangement of the double ball thrust-bearing, G^9, by which any longitudinal backlash can be taken up from beneath. Incidentally, too, it may be mentioned that the movements of the steering-wheel in no way affect either of the engine-controls, for the lever, G, normally moves with the steering-wheel, owing to the provision of a friction catch device between the steering-spindle and the fulcrum-collar.

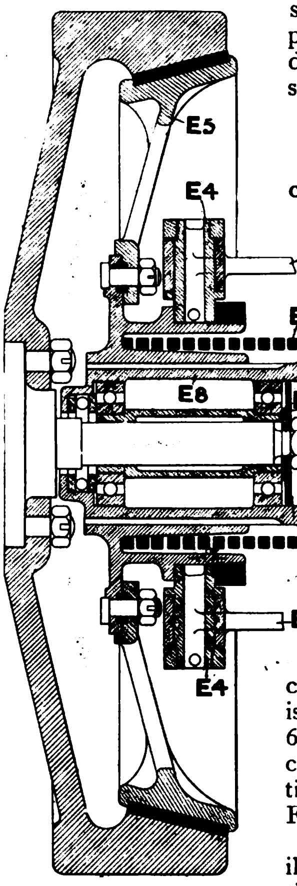


Fig. 6.—Section through the Critchley-Norris main clutch, showing the self-contained arrangement of the clutch-cone, with its ball-bearings.

The Main Clutch.

The special features of the clutch, which is of the leather-faced cone type, are that it is so arranged upon the projecting end of the crank-shaft, that no end-thrust is normally imposed upon that shaft, and that it is operated by means of two eccentrics, E^1, instead of by an ordinary clutch-fork. The clutch itself is shown sectionally in Fig. 6, and the operating mechanism, which renders it particularly light in action, in Fig. 7.

Referring to the former illustration, it will be seen that the leather-faced clutch-cone, E^5, is normally forced into engagement by the spring, E^6, the moving member being carried by feather-keys on the central boss, E^8. The clutch-spring itself is rendered adjustable by the nut, E^7, while between the casting, E^8, and the projecting end of the crank-shaft, are two ball-races as well as a ball thrust-bearing. The inner members of these bearings are secured to the crank-shaft by the collar, E^9, and the casting, E^8, also receives the special universal joint, A^1, to which the propeller-shaft, A, is coupled up.

For withdrawing the clutch-cone, E^5, the two eccentric rods, E^3, are connected to a special engagement ring, E^4, which rides in a groove provided for it, as seen in the drawing. The precise manner in which the eccentrics, E^1, are arranged in conjunction with the clutch-pedal, E, and the dash-pot, E^2, is well shown in Fig. 7, the upper drawing in which is a side elevation, while in the lower drawing the mechanism is shown in plan.

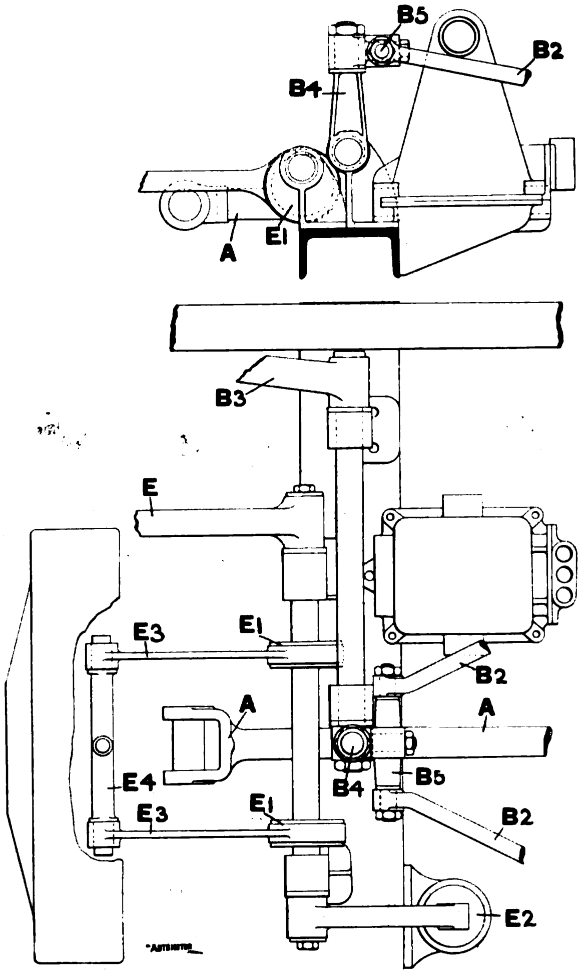


Fig. 7.—Side elevation and plan, showing the clutch-operating mechanism and the compensating-gear for the foot-brakes.

In Fig. 7 the method adopted for compensating the two brakes on the countershaft is also rendered clear. Mounted on the same shaft as the brake-pedal, B^3, is an upwardly projecting lever, B^4, which forms a pivot pin at its upper end to allow a connecting-link, B^5, to swing freely about it. It is to the ends of this yoke, B^5, which is also provided with a horizontal fulcrum-pin, that the two brake-operating rods, B^2, are hinged.

(*To be continued.*)

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A Non-Committal Chancellor of the Exchequer.

ONE of the "antiautomobilemonomaniacs" who have been returned to the present House of Commons, recently put a question to the Chancellor of the Exchequer as to whether he would consider the advisability of introducing an increased tax on yachts and motor cars. In reply Mr. Asquith declared that he could not deal with any proposals of this kind till he brought forward his Budget.

The Car Episcopal.

THE Bishop of Worcester, who has for a long time been an ardent motorist and has conducted at least one "visitation" per motor car, is now carrying out a system of special Lent services in various outlying districts of his diocese. The Bishop has laid out his tour on such extensive lines that he will travel 900 miles, and preach 60 separate and distinct sermons.

A SCIENTIFIC TYRE LEVER.

AMONG the large number of motorists who enjoy the freedom of carrying no chauffeur, there are probably comparatively few who have become so expert with the ordinary tyre lever as to cause them to look with contempt on a device which has been specially designed to reduce the labour and risks of tyre removal to a minimum, merely because it happens to be somewhat more complicated in itself than the dangerously simple orthodox tool.

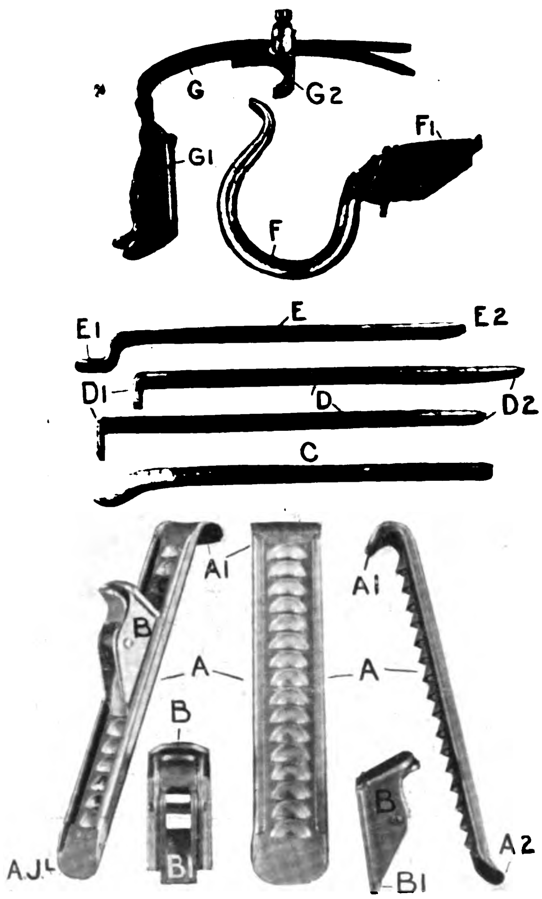


Fig. 1.—The Helena Tyre Outfit. View of the complete set of tools comprised in the outfit.

At first sight Messrs. Lacoste's "Helena" tyre outfit does undoubtedly seem to consist of an unnecessarily large number of parts, but when it is seen how well each serves its particular purpose, the practical value of this very cunningly-devised tool becomes apparent. Such an outfit might even be said to cause an operation to take more time than would be required by an expert using the three regulation levers, but that again will hardly be considered as a drawback by the majority. In all, there are a dozen different pieces in the complete set (Fig. 1), and each is brought into play at some definite stage in the removal or when replacing an outer cover. For the purpose of illustrating their use we have taken the special set of photographs which accompany this article, these being arranged in such a way as to represent the more important operations in their correct sequence.

The "Helena" Outfit.

Before describing these illustrations, however, some further mention of the tools themselves will be of service in enabling their action to be more readily understood. Three ladders, A, form the fundamental parts of the whole outfit. One end, A^1, of each ladder is curled over so that it can hook over the rim of the wheel; the other ends are straight, with the exception of that (A^2) of one of the ladders, which is slightly bent, for a purpose to be described presently. Belonging to each ladder is a small carrier, B, which is retained in place on the ladder by its flanged sides, and by the spring catch, B^1, which rests on the rung. This spring catch, B^1, acts like a ratchet-pawl on the ladder, so that while the carrier can be easily pushed up the ladder it cannot be brought down again unless the catch, B^1, is released previously. These carriers have, it will be noticed, peculiar sloping tops, which tend to cause anything resting upon them to slide off when they come to the top rung, but it may be mentioned here—for it is obviously an important point—that the carrier itself is automatically prevented from coming off when it reaches the top.

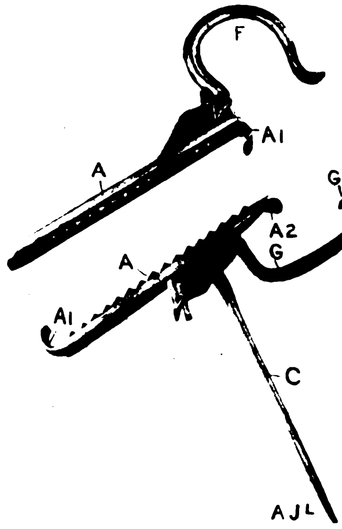


Fig. 2.—The Helena Tyre Outfit. Two important combinations of the various parts of the outfit. Above is the hook for lifting the cover in order to insert the valve, while beneath is the strap attachment to facilitate the initial freeing of the beading from under the rim.

In order to move the carrier, a lever, C, is provided which can be inserted through a hole so that its end engages with a rung in the ladder. Although not otherwise peculiar, it has been carefully designed to suit its work, and when being used it acts like a ratchet-lever and is easily manipulated. Accessories to these ladders, A, are two special fittings, F and G, each of which has its own carrier, F^1 and G^1, respectively. Of these, the former is a special hook for raising the edge of the cover when inserting the valve or the security bolts, and the latter is a strap for use when first loosening the cover prior to removal. In addition to these are three supplementary tools, D and E, which are in no way part of the ladder equipment. Two of them—those marked D—are alike, being flat steel rods with simple turned up ends, D^1, the other, E, has a specially bent extremity, E^1. The rods, D, are for the purpose of acting as slides to be inserted between the cover and the rim, thus enabling it to be easily drawn off; the other rod, E, is for picking the near-side beading out of the rim prior to the removal of the inner tube. Each of these tools has been specially constructed with the object of rendering damage to the tube practically impossible when using them with reasonable care, and to so far reduce the necessity for "knowing the knack," that single-handed tyre removal becomes a straightforward operation to every average motorist.

(*To be concluded.*)

* * *

THE SOAMES AND LANGDON-DAVIES THROTTLE-VALVE.

It is now nearly three years since we first described a special type of throttle-valve which had at that time (April 4th, 1903) been constructed in a somewhat crude form and had been used by Messrs. Soames and Langdon-Davies on the special cars which they then built. This device has now been further developed by them, and has recently been put on the market, compactly designed for use on any type of petrol vehicle. Primarily, it may be said that its object is two-fold, for it not only serves to regulate the quantity of mixture that is drawn into the cylinders, but it enables pure air to be admitted when the car is running down hill. It also has, however, more far-reaching effects than these upon any engine to which it may be fitted, for it tends to give very much the same effect as if variable-lift inlet-valves were employed, and materially alters the conditions that prevail inside the carburettor when the engine is running on light loads.

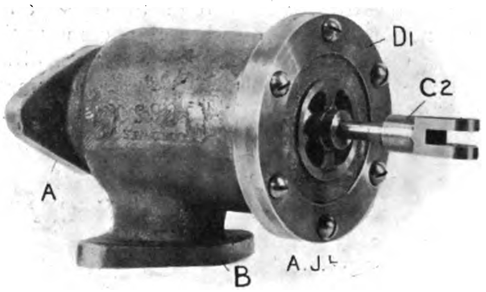


Fig. 1.—The Soames and Langdon-Davies Throttle-Valve.

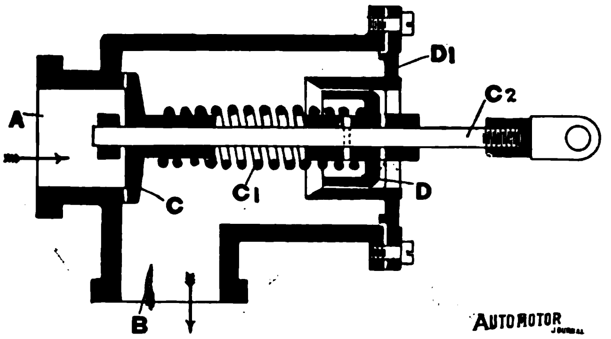


Fig. 2.—Sectional drawing showing the internal construction of the Soames and Langdon-Davies Throttle-Valve.

Referring to our illustrations, the external appearance of this valve is shown in Fig. 1, a sectional drawing is given in Fig. 2, and Fig. 3 includes other photographic views that assist materially in rendering clear its construction. The orifice, A, is connected to the carburettor, and the other pipe-connection, B, receives the induction-pipe that leads to the inlet-valves of the engine. Regulating the passage of the explosive mixture, is the valve, C, which is free to slide upon the hand-controlled (or governor-controlled) spindle, C^2, but is normally held in its "closed" position by the spring, C^1. As the spindle, C^2, is pushed inward or drawn outwardly, so the pressure of the spring, C^1, upon the valve, C, is increased or decreased, because the sleeve, D—against which the spring presses—is securely fixed to the spindle. In the former case the valve, C, remains upon its seat until the suction of the engine is sufficient to overcome the strength of the spring, C^1, and hence it tends to open late and to close early during each suction stroke. It therefore only admits a relatively small combustible charge, even though the suddenly entering air has a powerful induction effect upon the spray-jet in the carburettor.

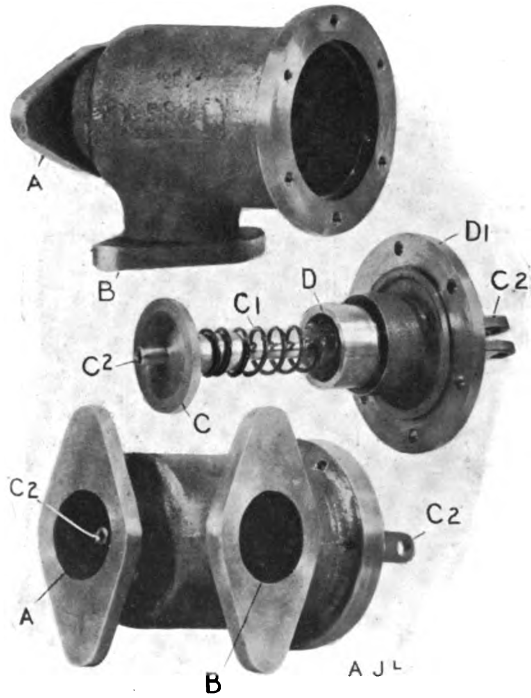


Fig. 3.—Two views of the Soames and Langdon-Davies Throttle-Valve; in the upper illustration, the interior portion has been removed and is shown separately.

Such is the strength of the comparatively long spring, C^1, that when the spindle, C^2, is pushed inward far enough for the sleeve, D, to clear the cylindrical guide formed for it in the cover-casting, D^1, the valve, C, remains closed during the entire suction-strokes of the engine, but then, it will be noticed, pure air can find its way direct from the atmosphere to the engine. This cold air, entering between the sleeve, D, and the cover-casting, D^1, serves to scavenge the cylinders and to cool them.

THE PRADEAU WHEEL.

In principle the Pradeau wheel is extremely simple; its resiliency is obtained by a set of helical springs arranged radially between the inner and outer members. In actual construction, however, it embodies some novel features, which give it a distinct individuality; thus the spring-drive element has been ingeniously introduced, and provision has been made for the automatic lubrication of the "mechanism" from the hub.

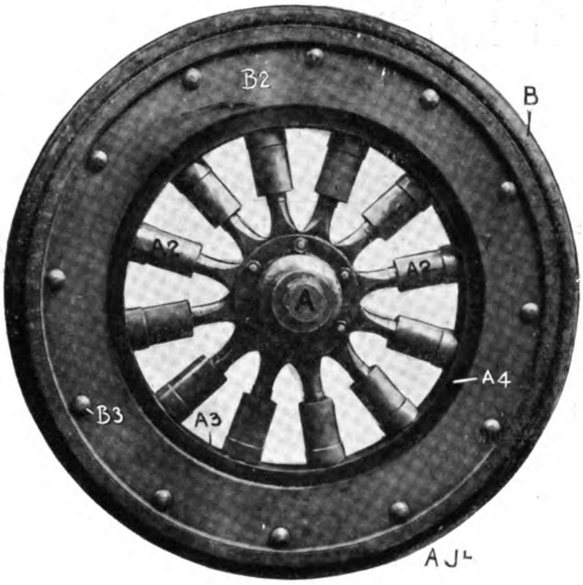


Fig. 1.—The Pradeau Wheel. View of a complete wheel showing the cylinders, A^2 (which contain the springs), and the overlapping flanges, A^4, and B^2, of the inner and outer members which give the wheel its lateral stability.

There are few separate parts, and the springs are arranged near the rim in order to reduce the weight of the outer member as much as possible. The solid rubber tyre, B, is mounted on the flat rim, B^1, and is held in place by the side flanges, B^2, which are secured by bolts, B^3. There is no felloe, as is clearly shown by our sectional drawing, Fig. 2, but there are small lugs inside the rim which afford a holding for the bolts, B^3. From the photograph it would appear as if there were a very deep felloe, but this is only an impression given by the depth of the flanges, B^2, which overlap corresponding flanges, A^4, on the rim, A^3, of the inner member, A. This overlap is a very essential feature, for it gives the wheel, as a whole, the lateral stability which enables it to resist side shocks.

One of the most noticeable features of the wheel are the steel cylinders, A^2, on the ends of the spokes. They are hollow, and are open at their outer ends; they are also rigidly connected to the rim, A^3. Thus the inner member, from the hub, A, to the flanges, A^4, is itself a complete wheel, neither is it dissimilar to others of orthodox construction. Inside each cylinder are helical compression springs, A^5, and against them rest plungers, B^5, which have their forked ends attached by links, B^6, to the brackets, B^4. These links hang outwards, so that they are always in tension, and when the "drive" comes on them they swing to one side—as shown by the sketch on the right of Fig. 2—which has the effect of slightly pushing in the plungers. In this manner the wheel provides a spring-drive effect, but not in a very pronounced form because the initial leverage over the springs very rapidly diminishes as the link, B^5, swings over, and the actual motion is thus very limited.

Apart altogether from this function, these links, B^6, are an essential feature in the ordinary resiliency of the wheels. If the plungers were merely hinged to the outer rim, they would obviously jam against the sides of their cylinders as soon as there was any relative motion between the two members. It is on this account, therefore, that they must be comparatively free at one extremity, and as the link connection not only does this in a simple manner, but affords the additional advantage of a spring-drive, its *raison d'être* is obvious.

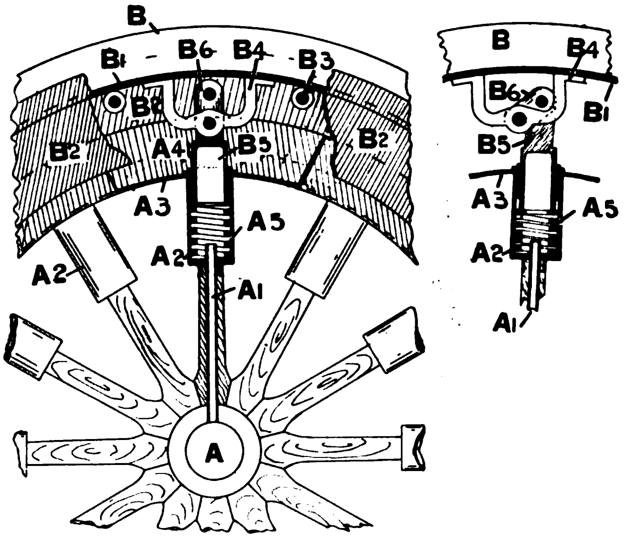


Fig. 2.—The Pradeau Wheel. Sectional drawing showing the construction of the wheel. On the right, is a sketch illustrating how the "spring-drive" effect is obtained by the link coupling between the plungers and the outer rim.

Lubrication in spring wheels is a very important detail, and special provision has been made for its easy accomplishment in this device. A tube, A^1, passes through the core of each spoke, so that the axle and the wheel are both oiled at the same time.

* * * *

Motor 'Buses in Yorkshire.

The petrol motor 'bus is doing excellent service in London and other places where the gradients that have to be encountered are not extreme. How far it may be suited for a hilly district like that of the Yeadon Urban District, in Yorkshire, where the hills are so severe as to place horse traction at a serious disadvantage, is likely soon to be decided; for the Yeadon Council intend to introduce a motor 'bus service, and have appointed a sub-committee to visit districts where motor 'buses are now in use, and to report on their various merits. Considering the excellent behaviour of steam 'buses on heavy gradients, it will be of interest to note which type of vehicle the Yeadon Council ultimately select.

BUYERS' GUIDE TO THE PLEASURE CARS OF 1906.—SUPPLEMENTAL TABLE.

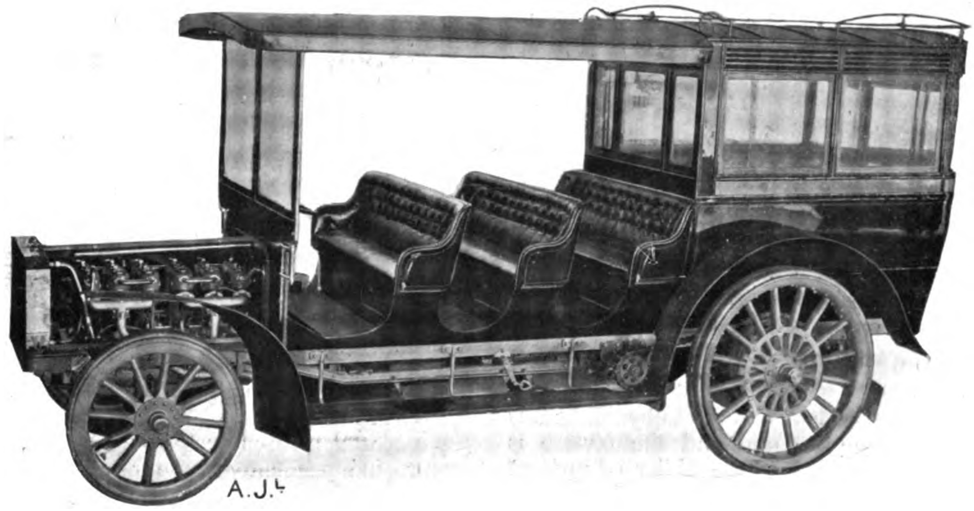
(The full table appeared in THE AUTOMOTOR JOURNAL of February 17th.)

LEADING CHARACTERISTICS.						CONSTRUCTIONAL DETAILS.																								Country of Origin.	Last Described in The Automotor Journal.	
Description.	Seating Capacity.	Geared to m.p.h.	Drive.	Price.		ENGINE.									TRANSMISSION.								BEARINGS.				DIMENSIONS.					
				Chassis.	With Standard Body.	Type.	Bore.	Stroke.	Normal Speed.	Piston Displacement, 10,000 cub. ins. per min.	Ignition.	Fuel Feed.	Lubrication.	Control.	Clutch.	Change-speed-gear.	Number.	"Direct."	Speeds.				Engine.	Gear.	Rear Wheels.	Front Wheels.	Wheel Base.	Track.	Driving Tyres.		Vol.	Page.
																			1st.	2nd.	3rd.	4th.										
Six-cylinder Cars.																																
h.p.				£	£		mm. or ins.		r.p.m.										m.p.h.								ft. ins.	ft. ins.	mm. or ins.			
60 Hurst	5	—	S	*675*	—	V	4½	5½	1000	52·6	*b, m*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	P	P	P	P	10 3	4 4	880 × 120	B		
26–30 Elswick	5	—	S	*600*	—	V	—	—	—	—	*M*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	P	P	B	B	10 3	4 6	32 × 4¼	B		
20–24 Premier	5	—	S	*567*	—	V	95	120	1200	37·5	*b, m*	*g*	*g*	H	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	9 9	4 6	810 × 90	Be		
30 Hurst	5	45	S	*525*	—	V	4	4½	1000	33·6	*b, m*	*g*	*g*	G	*lc*	S	3	*3rd*	—	—	45	—	P	P	P	P	10 3	4 4	880 × 120	B		
Four-cylinder Cars.																																
60 Benz...	5	52	CC	*1,560*	—	V	145	140	1250	71·0	*b, M*	*p*	*g*	H	*lc*	S	4	—	15	27	39	52	P	B	B	B	10 4	4 9	935 × 135*f*	G		
40–50 Marchand ...	5	—	CC	*1,197*	—	V	—	—	—	—	*m*	*g*	*p*	H	*md*	S	4	*4th*	—	—	—	—	P	B	B	B	10 2	4 9	920 × 120*f*	I		
40 Benz...	5	44	CC	*1,060*	—	V	120	130	1250	45·0	*b, M*	*p*	*g*	H	*lc*	S	4	*4th*	11	23	30	44	P	B	B	B	10 8	4 9	935 × 135*f*	G		
50–65 F.A.I.F. ...	5	—	CC	*1,000*	—	V	145	160	800	51·5	*m*	*p*	*g*	H	*md*	S	4	—	—	—	—	—	P	B	B	B	10 0	4 7	920 × 120*f*	I		
28 Benz...	5	—	CC	*885*	—	V	105	130	1250	34·4	*b, M*	*p*	*g*	H	*lc*	S	4	*4th*	11	22	29	42	P	B	B	B	10 4	4 9	880 × 125*f*	G		
28 Benz...	—	—	S	*835*	—	V	105	130	1000	27·5	*b, M*	—	*g*	H	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	10 4	4 9	880 × 125*f*	G		
30–40 Marchand ...	5	—	CC	*792*	—	V	—	—	—	—	*m*	*g*	*p*	H	*md*	S	4	*4th*	—	—	—	—	P	B	B	B	10 2	4 9	920 × 120*f*	I		
30–40 Herald	—	—	—	*780*	—	V	—	—	—	—	*b, m*	*p*	*g*	H	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	—	—	920 × 120	F		
28–35 F.A.I.F. ...	5	—	CC	*720*	—	V	130	150	800	39·1	*m*	*p*	*g*	H	*md*	S	4	—	—	—	—	—	P	B	B	B	9 11	4 7	920 × 120	I		
24 Elswick	—	—	S	*650*	—	V	4⅜	4⅜	900	23·6	*M*	*g*	*g*	G	*lc*	S	3	*3rd*	12	25	35	—	P	P	P	B	10 3	4 6	34 × 4¼	B		
22–28 Milano	5	—	la	*630*	700	V	108	130	1500	21·7	*b, m*	*p*	*g*	G	*lc*	S	4	*4th*	—	—	—	43	P	B	B	B	—	—	875 × 105	I		
20–25 Crossley ...	—	—	la	*625*	—	V	110	130	1000	29·5	*M*	*g*	*p*	H	*ex*	S	—	—	—	—	—	—	P	B	B	B	7 6	4 3	815 × 105	B, f		
20–24 Marchand ...	5	—	CC	*625*	—	V	—	—	—	—	*m*	*p*	*g*	H	*md*	S	3	*3rd*	—	—	—	—	P	B	B	B	9 0	—	815 × 105	I		
30 Westminster ..	5	—	CC	*525*	—	V	110	130	1000	29·5	*b(m)*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	P	B	B	B	9 6	4 8	880 × 120*f*	—		
16–22 F.A.I.F. ...	5	—	CC	*520*	—	V	100	130	800	20·0	*m*	*p*	*g*	H	*md*	S	4	—	—	—	—	—	P	B	B	B	9 6	4 7	880 × 120	I		
16–24 Herald	—	—	—	*512*	—	V	—	—	—	—	*b, m*	*g*	*g*	H	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	—	—	880 × 120	F		
15 Elswick	—	—	S	*500*	—	V	82	90	900	10·4	*b, m*	*g*	*g*	G	*lc*	S	3	*3rd*	12	25	35	—	P	P	P	B	9 4½	4 6	32 × 4¼	B		
20–24 Ader	5	—	CC	*500*	—	V	—	—	—	—	*b(m)*	*g*	*g*	G	*lc*	S	4	*4th*	—	—	—	—	P	B	P	P	10 3	—	875 × 105	F		
20–24 Premier	—	—	S	*483*	—	V	95	120	1200	25·0	*b, m*	*g*	*p*	G	*lc*	S	4	*4th*	—	—	—	—	P	B	B	B	—	—	810 × 90	Be		
16–20 Premier	—	—	S	*483*	—	V	100	120	1200	27·6	*b, m*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	P	B	B	B	9 9	4 6	810 × 90	Be		
14–18 Marchand ...	5	—	CC	*483*	—	V	—	—	—	—	*m*	*p*	*g*	H	*md*	S	3	*3rd*	—	—	—	—	P	B	B	B	8 8	4 3	810 × 90	I		
16–20 Robinson and Hole	5	40	S	*480*	—	V	90	110	900	15·3	*b(m)*	*p*	*g*	H	*lc*	S	3	*3rd*	10	25	40	—	P	B	B	B	—	4 2	810 × 90	B		
30 Gracile	—	—	S	*475*	—	V	—	—	—	—	*b, m*	*g*	*p*	H	*lc*	S	4	—	—	—	—	50	P	P	P	B	—	—	—	F		
20 Westminster ...	5	—	CC	*450*	—	V	95	120	1000	20·8	*b(m)*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	P	B	B	B	9 6	4 8	880 × 120*f*	—		
24 Gracile	5	40	S	*400*	—	V	—	—	—	—	*b(m)*	*g*	*p*	G	*lc*	S	3	—	—	—	40	—	P	P	B	B	—	—	—	F		
15–18 Hurst	5	35	S	*375*	425	V	4	4	1000	20·0	*b(m)*	*g*	*g*	G	*lc*	S	3	*3rd*	10	18	35	—	P	P	P	P	9 3	4 4	870 × 90	B		
Two-cylinder Cars.																																
10–12 Herald	—	—	—	*300*	—	V	—	—	—	—	*b, m*	*g*	*g*	H	*lc*	S	3	*3rd*	—	—	—	—	P	—	—	—	—	—	810 × 90	—		
One-cylinder Cars.																																
6½ Friswell	—	—	la	—	175	V	90	110	1600	6·6	*b*	—	—	H	*lc*	S	3	—	—	—	—	—	P	B	B	B	—	—	700 × 85	F		

THE AGRICULTURAL HALL SHOW.

DURING the week, which ends to-day (Saturday), Messrs. Cordingley's Eleventh Annual Motor Car Show, at the Agricultural Hall, has been attracting the usual varied throng; many on business, intent on purchasing a car or fixing up a contract for heavy vehicles, others merely on pleasure, and some who like to visit exhibitions in general in order that they may fancy themselves *au fait* with the movement.

There is always much that is interesting at Cordingley's Show, and much that renders it very unlike other automobile exhibitions. In the first place, comparatively few of the largest firms are represented in the pleasure car section—Messrs. Charles Jarrott and Letts, Humber, Limited, The British Automobile Commercial Syndicate, The Fiat Company, Messrs. Lamb Brothers, Lanchester, Hotchkiss, Mann and Overton, Mors, Darracq, Vinot, Rochet-Schneider, Oscar Cüpper (Metallurgique), Gobron-Brillie, Benz, Brouliot, Bollée, Florentia, Durham, Churchill, Fraschini, Peugeot, Herald, Cottereau, Prunel, Star, being amongst the conspicuous exceptions—on account of the bond which has been signed by many with the Motor Manufacturers' and Traders' Society. There is, consequently, ample room for newcomers to make an imposing *début* under conditions which do not unduly overshadow them.



AGRICULTURAL HALL SHOW.—The Thames Engineering Company's motor coach. This vehicle has a six-cylinder engine and one of its most noticeable features are the enormous driving wheels. It has been constructed for the London and South Coast Service and affords enclosed as well as open accommodation for the passengers.

Where the Agricultural Hall Show has its most solid interest, however, is in the industrial section. It is an exceedingly representative gathering of commercial vehicles, even although some of the well-known makers of motor 'buses have perforce to withhold their patronage like the touring car manufacturers. On the other hand, the steam vehicles—that truly British branch of the industry—have mustered in great force, and include, besides the well-known firms, a few new makers who are showing vehicles of considerable interest. These heavy steam vehicles have not, perhaps, the same absorbing fascination to the average visitor as has an up-to-date touring car; but they continue to come into more and more general use, and are now almost essential to the success of many large businesses. A short time ago it looked as though the demand for these steam wagons was on the wane, but it is evident from a glance at the exhibits on this occasion that such is far from being the case. Several of the large old-established engineering firms have taken up their manufacture recently, and a very marked all-round improvement in design is noticeable.

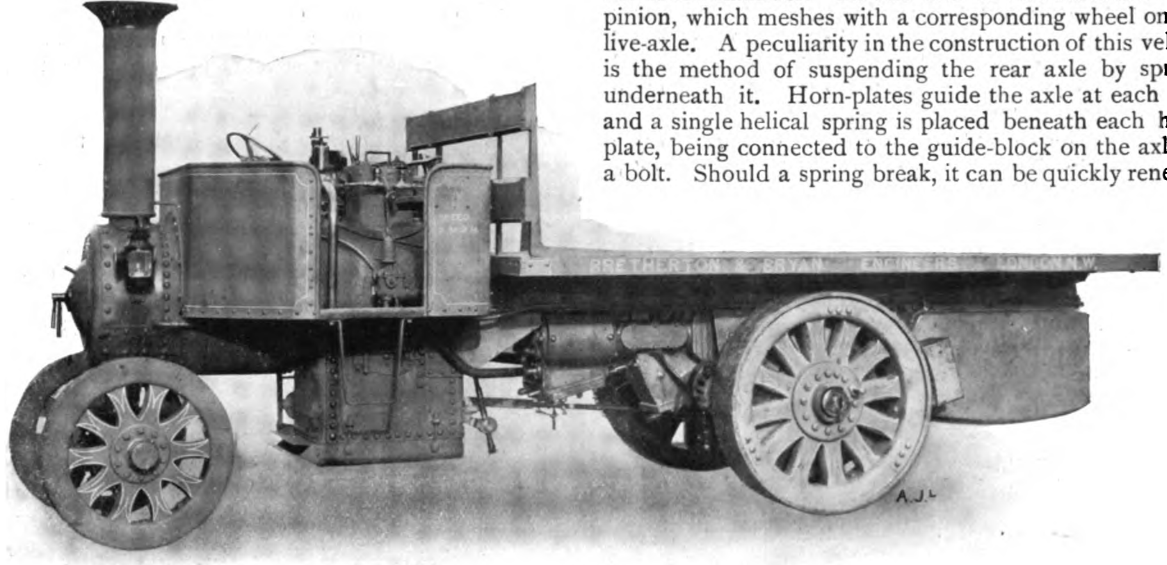
Industrial Vehicles.

It is chiefly in the Minor Hall that the industrial vehicles are to be found, for although such important firms as the Thames Engineering Company, Critchley-Norris, St. Pancras Ironworks, and the Lancashire Steam Motor Company occupy prominent positions in the main building, the smaller hall is entirely devoted to the heavy vehicles. Among the old-established firms who are exhibiting heavy steam vehicles here this year are the Yorkshire Steam Wagon Company, Fodens, Jesse Ellis, Manns, Stewart, Bath and Son, and Savage Bros., while Alley and MacLellan, Beyer and Peacock, and Bretherton and Bryan are among the newcomers. Of these latter Messrs. Alley and MacLellan show a particularly interesting machine.

The Sentinel Wagon.

It has been designed by Mr. Simpson, and gives striking evidence of being a most carefully thought out production, simplicity, accessibility and interchangeability looming large, instead of being allowed to remain among the abstract desirabilities. There are, for instance, only three sizes of pipes on the whole machine, while valves and other parts liable to need occasional replacement, are made, as far as possible, interchangeable. Then, too, the crank-chamber can be inspected with exceptional ease, and the fire-bars and ash-pan let down, without trouble, to facilitate clinkering. As a type, too, the 6-ton Sentinel wagon, as it is called, stands very much alone. It has a large, simple, two-cylinder, double-acting engine, which runs at a very slow speed, and drives direct from the crank-shaft to the live-axle by means of a single chain. There is thus no intermediate gearing, and no change-speed mechanism, but the engine is of exceptional size and power (6¾-in. bore by 10-in. stroke), and is well up to its work.

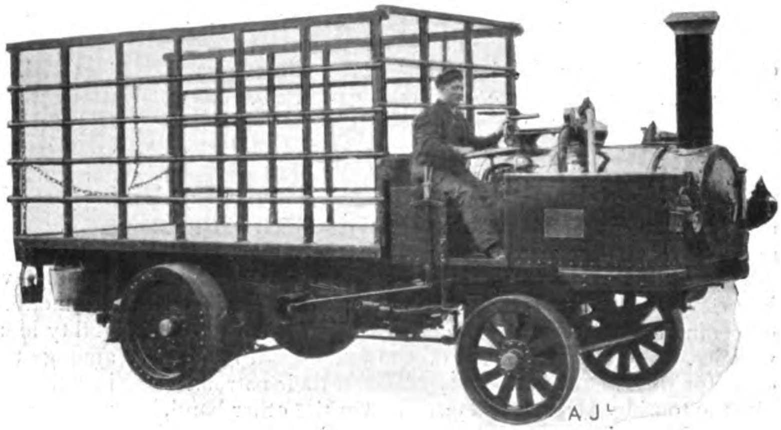
Separate mushroom valves for the admission and exhaust of the steam are placed below the cylinders at each end, and are operated by a central cam-shaft after the manner of petrol engines. This cam-shaft is mounted so that it can slide longitudinally, and it is by this means that the cut-off is made variable and the reverse is obtained. In front is a water-tube boiler of unusual construction, inasmuch as the tubes are arranged in a peculiar manner, on the slant, in order to assist the circulation, to give additional facilities for rapid steaming when ascending inclines, and to keep the tubes at all times covered. Special provision is made for rapid clinkering by hinging the fire-bars, and the water-filled ash-pan is interconnected with a lever in the cab so that it can be readily adjusted to alter the draught. By removing two rows of bolts, the inner shell of the boiler can be let down, and the tubes cleaned without uncoupling any of the outer connections. Hand and foot control on the steam is provided, thus enabling the engine to be instantly slowed down, or used as a brake if required. Another special feature is the construction of the wheels, which have cast-steel centres with sectional wood felloes pressed in place between them and the steel tyres. On the front wheels, the centres are dished, so that the steering-knuckles may come in the plane of the wheel, and thus facilitate steering.



AGRICULTURAL HALL SHOW.—The Bretherton and Bryan steam lurry, which has a loco type boiler and the driver's cab ingeniously arranged on the top of it to economise space. It is a live-axle vehicle and is gear-driven. One of its special features is the suspension of the rear axle, which is hung in horn-plates by helical springs underneath it. These springs can be easily replaced without dismantling any part of the chassis.

The Bretherton and Bryan Wagon.

A simple, straightforward job characterises the construction of the new Bretherton and Bryan steam wagon. It has a loco type boiler, and one of the peculiar features is the arrangement of the driver's cab above it, so as to economise space as much as possible. Beneath the frame is the usual type of horizontal compound engine, with a two-speed gear, driving a countershaft which runs through the crank-chamber. At one end of this shaft is a spur-pinion, which meshes with a corresponding wheel on the live-axle. A peculiarity in the construction of this vehicle is the method of suspending the rear axle by springs underneath it. Horn-plates guide the axle at each end, and a single helical spring is placed beneath each horn-plate, being connected to the guide-block on the axle by a bolt. Should a spring break, it can be quickly renewed by removing the nut beneath the spring, no other part having to be dismounted for the purpose. As on many heavy lurries of the present day, the front axle is carried by a central pivot-pin, which allows it to tilt about its centre independently of the frame.

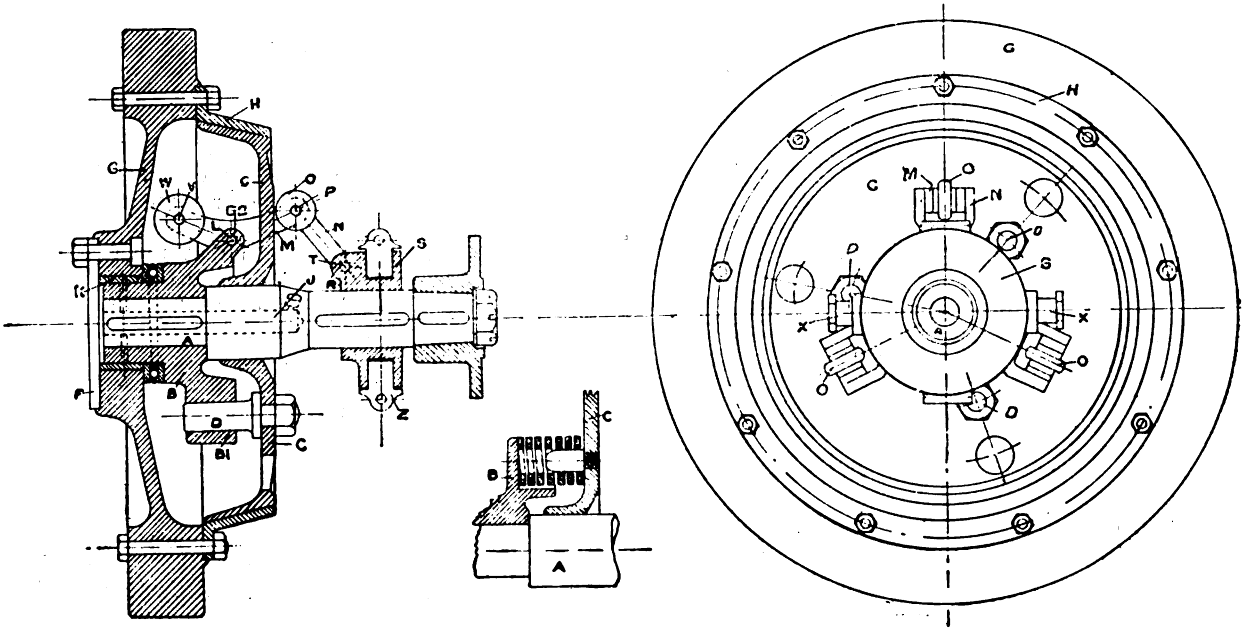


AGRICULTURAL HALL SHOW.—A 5-ton Savage Steam Lurry. These well-known vehicles are chain-driven machines, have loco. type boilers of 110 sq. ft. heating surface, and compound engines with cylinders of 4½-in. and 5-in. bore by 7½-in. stroke.

Beyer and Peacock Lurry.

Very considerable interest naturally attaches to the products of such a firm as Beyer and Peacock, who have now entered the motor industry, and are placing an original design of steam lurry on the market. These

"Gorton" vehicles are driven by side-chains from a simple 2-cylinder engine of 5-in. stroke and 3¾-in. bore. There is an intermediate two-speed reduction gear on to the differential countershaft, and a flexible coupling is interposed between this gear and the engine, which is supported by a three-point suspension. Sprocket wheels designed on the "Guthrie" principle are employed in order to better distribute the load over the links of the chain that are in mesh and to automatically compensate for wear. Hoy's boiler, of the "bottle fire-box" type, is used, this being a combination of the locomotive and vertical types, and exceedingly compact and accessible in design. Another special feature is the steering-gear, also "Hoy's" patent, which is designed to confine all strains, whether from shock due to uneven roads, or to the steering, on the front axle. The gear itself is fixed rigidly to the axle, but provision is made for the necessary deflection of the front springs to take place without affecting the steering-wheel.



AGRICULTURAL HALL SHOW.—Sections and Front Elevation of Durham Churchill's "Champion" Clutch.

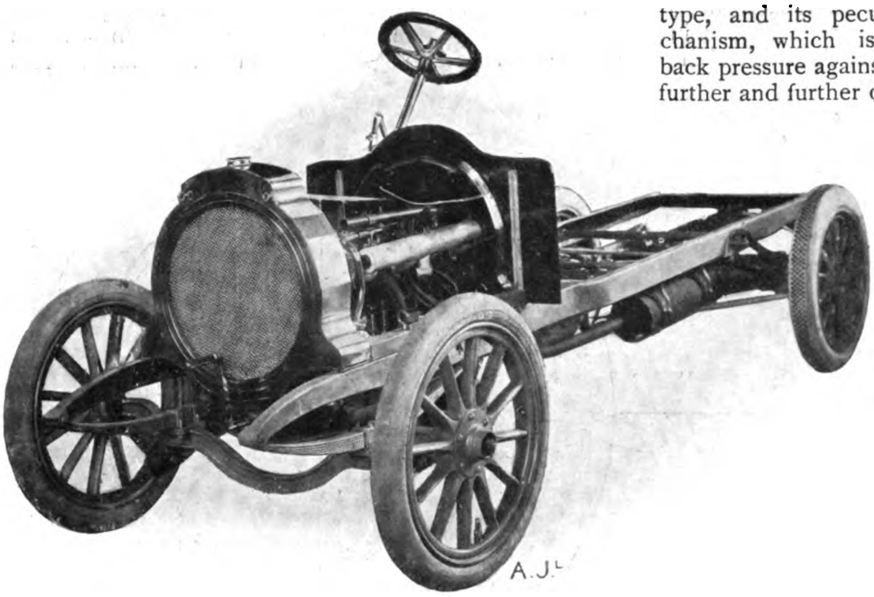
Other Steam Wagons.

Among the other new steam lurries, mention may be made of that shown by the Thames Engineering Company, which has a propeller shaft drive to the live-rear-axle, and the Carter steam wagon, which has an inverted vertical compound engine, driving a countershaft from which the power is transmitted by a single chain. Garrett and Sons, who last year showed a self-propelled lurry, now also exhibit a tractor. An interesting vehicle is that shown by Savage Brothers, which has a portable electric light plant fixed across the frame between the cab and the platform, the object of this being, that after delivering its load at night, the small engine that is coupled up to the dynamo can be started up, and be made to provide light for any operations which may be in progress. One such machine among a fleet would be a really useful acquisition to any large contractor working in outlying districts, for the wagon need never be idle when the light is not wanted.

Petrol Lurries.

It is mostly among the public service vehicles that petrol has, as yet, found its great field. Practically all the chassis suitable for 'buses now being shown are fitted with petrol engines, and in this section also several new firms are for the first time exhibiting their products. Notable among these is the Critchley-Norris 'bus, which we are now describing in detail in our columns. It is a well-designed and strongly built machine, which has many novel points of interest, and well repays a visit to the Show, especially to those who prefer to buy all-British vehicles. There is also another interesting British exhibit on the Thames Engineering Company's stall, this being one of the new London and South Coast motor coaches, which is fitted with a 6-cylinder engine. Extraordinary large driving wheels, 52 inches in diameter, are fitted, and these, together with the exceptionally roomy body, give the entire vehicle a very original appearance.

Certain modifications have been made in the Leyland 'buses since they were first introduced a year ago. They are among the few heavy petrol vehicles employing a propeller-shaft driven live-axle. The new model now has the differential-gear separate from the axle itself, it being mounted just alongside so that it drives the axle through spur gearing. Thus, the differential is still enclosed in the same casing, but forms a separate unit, which is less liable to damage in the event of undue shock. The propeller-shaft is enclosed in a tubular casing, which is carried at its forward end in a ball and socket bracket attached to the frame. It is through this tube that the reaction of the drive is transmitted to the frame. Reynolds Jackson, who have formerly only been building small pleasure cars, have now entered the heavy section with a 'bus chassis. It has side-chain transmission, ordinary sliding spur-wheel gearing, a cone clutch and a 4-cylinder engine. Gear-box and differential-casing are separate castings, and are placed some distance apart, while inter-connected foot-brakes are placed at each end of the propeller-shaft. A 'bus is also shown by Dougills, and has their usual "Frick" gear, in which friction discs are employed to give a gradual variation in speed. A single chain drives the live-rear-axle.



AGRICULTURAL HALL SHOW.—The 24-h.p. Gracile Chassis, which is of the live-axle type, has a four-cylinder engine, cone clutch, and three-speed-gear-box operated on the gate principle.

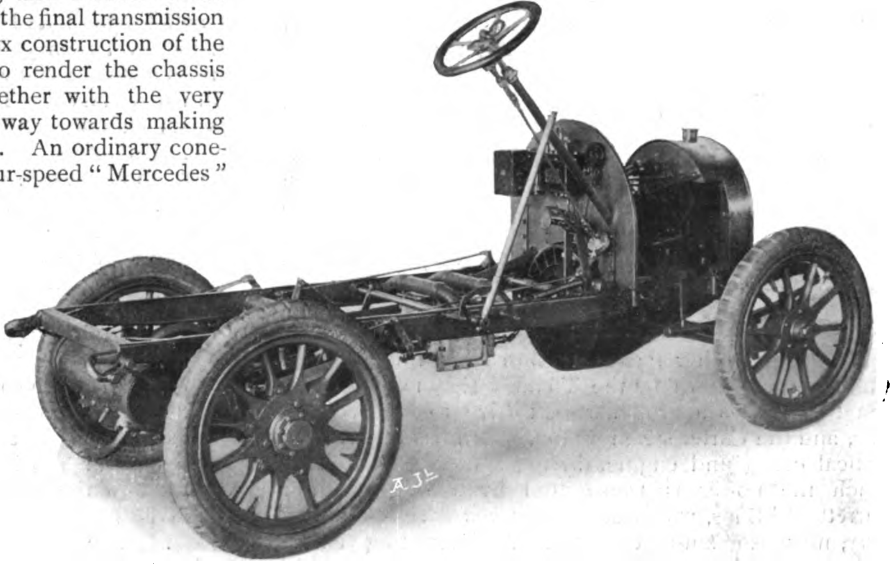
One of the most interesting of the new 'bus chassis is the Turgan, which is now in this country for the first time, although well known in France. The large model has a 40–50-h.p. 4-cylinder engine, and Renold silent chains replace the usual roller type in the final transmission to the road wheels. A peculiar box construction of the frame has been adopted in order to render the chassis particularly strong, and this, together with the very powerful engine, should go a long way towards making it a satisfactory vehicle for its work. An ordinary cone-clutch with fan-blade arms, and a four-speed "Mercedes" gear are used in the transmission.

As a practical demonstration of its capabilities, the Prunel 'bus, which is a prominent exhibit in the Show, and is the first of that make, was driven over from Paris and duly arrived at its destination to time. It has a 30-h.p. 4-cylinder engine, and is chain driven. The gear-box is of cast steel and provides three speeds forward and a reverse.

Hallamshire Vehicles and "Champion" Clutches.

Another exhibit among the public service vehicles is Messrs. Durham Churchill's charabanc. It is constructed to carry twenty-eight passengers, and has a 24–30-h.p. Aster engine. The gear-box is of a special type, all the wheels being in mesh, and the gears being engaged by sliding a key along inside the shaft. A long propeller-shaft connects the gear-box with the differential-countershaft, which is contained in a separate casing, and the final transmission to the road wheels is by side chains. One of the most interesting features on Hallamshire vehicles is Messrs. Durham Churchill's "Champion" clutch, of which we give line drawings showing section and elevation. It is of the internal metal cone type, and its peculiarity lies in the operating mechanism, which is designed to give a diminishing back pressure against the pedal as the clutch is thrust further and further out of engagement.

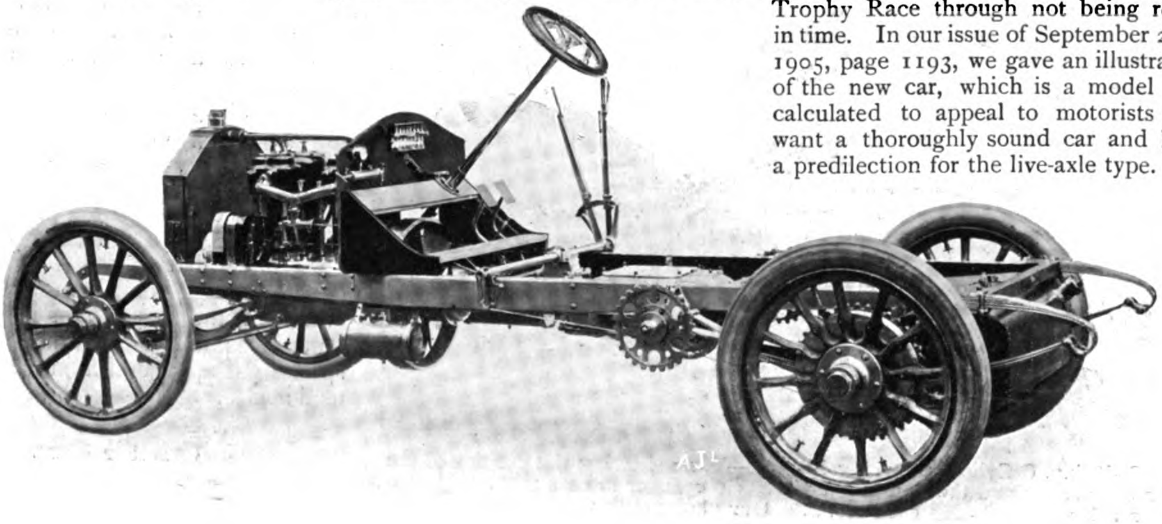
Finally the mechanism would reach a "dead-centre," where no back pressure at all would be felt, but this extreme position has been rendered impossible in the actual device, because it would naturally interfere with the adaptability of the clutch to motor car requirements.



AGRICULTURAL HALL SHOW.—The Gregoire Chassis, which is fitted with the Scowen gear. This gear is one of the novelties of the Show, for it dispenses with a side lever by performing the change of speed with the clutch pedal. An indicator is provided beneath the steering wheel by which the driver can choose the next speed in advance.

Referring to our illustration, it will be seen that the sleeve, S—which is directly operated by the pedal—is connected to the three toggle-levers, N, M, which are hinged at P and anchored at L to an inner portion of the clutch casting. Mounted on the pins, P, which form the hinges of these levers, are rollers, O, which rest against the face of the clutch-member, C. As the pedal is depressed, these rollers are forced harder against the face of the cone-clutch, C, until the clutch is disengaged. At first the thrust is comparatively direct, but as the cone, C, moves along the shaft, and the rollers, O, move outwards, the toggle-levers, N, M, make a more acute angle with one another, so that the back pressure of the three clutch springs is not fully transmitted to the pedal. If the lever, N, could assume a vertical position the clutch would be locked "out," but this is, for reasons already explained, made impossible. Counter-weights, W, are fitted to neutralise the effect of centrifugal force on the rollers, O.

Owing to the necessity for anchoring the toggle levers inside the clutch, a separate casting, B, has been provided, and it will be noticed in the design illustrated that this member is keyed to the clutch-shaft, A, and forms a large bearing for that shaft in the boss of the flywheel, G^1. It is through this member, B, that the power is transmitted by means of the driving-pins, D. For the purposes of alignment a very long spigot, J, passes from the flange, F, of the crank-shaft up the middle of the clutch shaft, A.

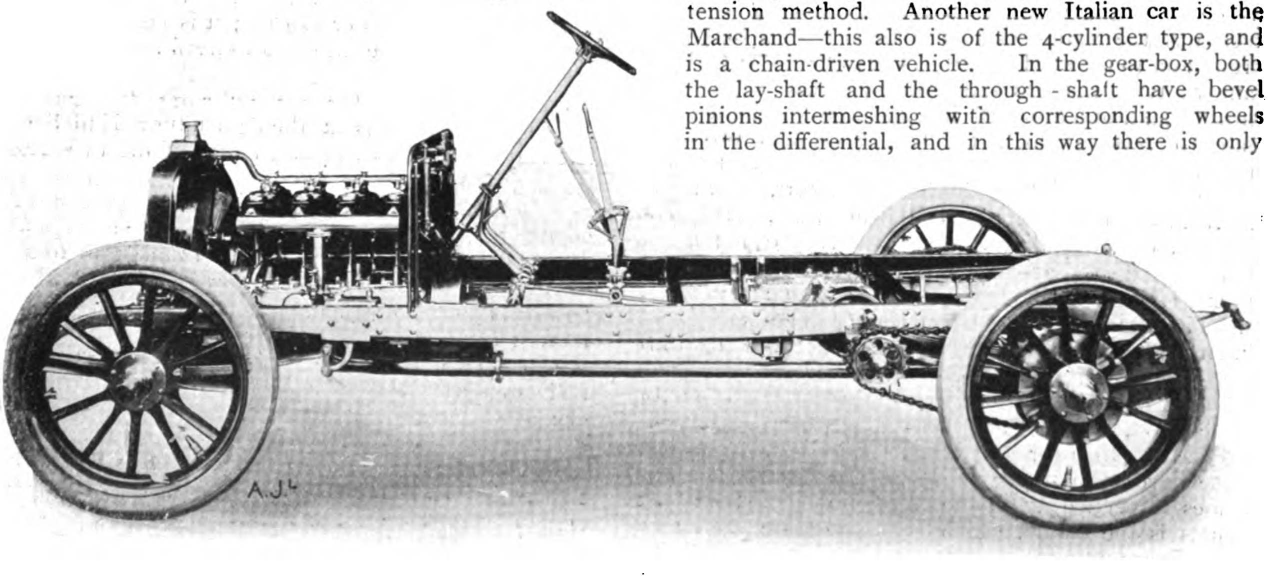


AGRICULTURAL HALL SHOW.—The Isotta Fraschini Chassis, which now makes its first appearance in this country. It is a typical Italian car, and is of the chain-driven type.

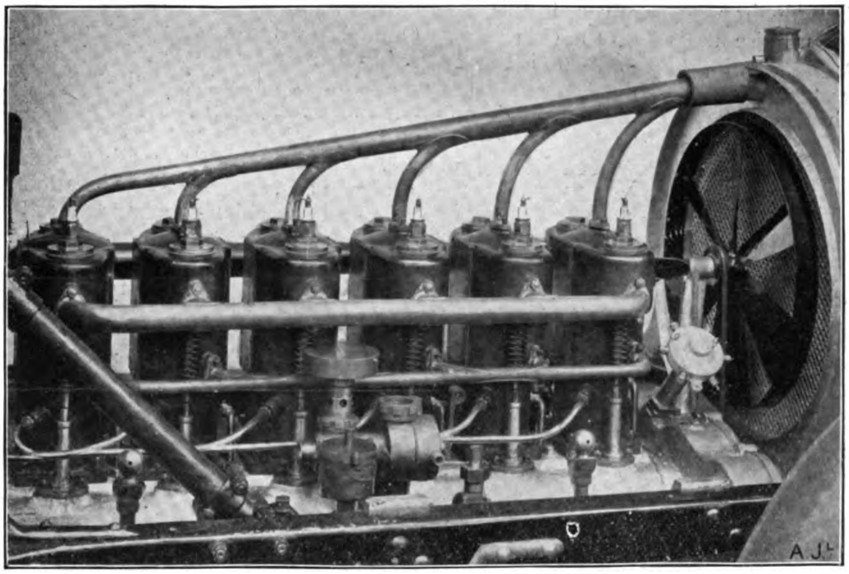
Pleasure Cars.

There are several new models in the pleasure vehicle section, but some of them are only new as regards their advent in this country, having been previously exhibited on the Continent. One of the most interesting of the new cars is the 20–25-h.p. live-axle Crossley, which has not been shown at an exhibition previously, although the first one made only just missed taking part in the Tourist Trophy Race through not being ready in time. In our issue of September 23rd, 1905, page 1193, we gave an illustration of the new car, which is a model well calculated to appeal to motorists who want a thoroughly sound car and have a predilection for the live-axle type.

We have, of late, had frequent occasion to refer to the extraordinary rapid growth of the Italian automobile industry, and at this, as at other exhibitions recently, the Italian chassis are very much in evidence. For the first time the English public is now introduced to the Issota-Fraschini, which, however, has been seen previously in Paris. It is one of those thoroughly up-to-date vehicles which have characterised the best Italian productions. Of the chain-driven type, it is fitted with a 4-cylinder engine, a disc clutch, and Mercedes type gear. Unlike the majority of these Italian vehicles, however, high-tension magneto ignition is employed instead of the low-tension method. Another new Italian car is the Marchand—this also is of the 4-cylinder type, and is a chain-driven vehicle. In the gear-box, both the lay-shaft and the through-shaft have bevel pinions intermeshing with corresponding wheels in the differential, and in this way there is only



AGRICULTURAL HALL SHOW.—The Marchand Car, one of the new Italian vehicles. It is a chain-driven vehicle and has a four-cylinder engine. There is a multiple-disc clutch, and the change-speed-gear is arranged so that there is only a single reduction for the three low speeds although the direct through drive is retained on the top gear.



The 30-40-h.p. 6-Cylinder Humber Engine.—View showing the position of the Krebs carburettor and the commutator. Each cylinder is cast separately, and there is a bearing between each crank. Our photograph was taken while the engine was in course of erection, and it does not show some of the pipe fittings and minor details. A variable lift to the inlet-valves is employed to control the engine instead of a throttle valve.

a single reduction on the low speeds, while the direct drive is retained on the top gear. Shown by the same firm—the Premier Motor Company—is a new Belgian chassis, known as the Premier. This is of the live-axle type, and an interesting feature in its construction is the addition of another stationary axle behind that formed by the live-axle casing. In accordance with modern practice, the road-wheels run on tubular extensions of the axle-casing, instead of being fixed to the revolving shaft, but the entire construction is rendered particularly rigid on account of the supplementary cross-member. An interesting departure is made in the construction of the engine-cylinders used on this car. They are of steel, but the water-jackets are of cast-iron, and are screwed on to the steel bodies. The gear-box is of the Panhard type, but has the lay-shaft placed above the through-shaft, and arranged in such a way that it can cease to revolve when the direct through drive is in use.

The Milano car, shown by Milano Motors, Ltd., is, as its name implies, of Italian origin. It is only constructed in one size, the engine being rated at 22–28-h.p. High-tension battery ignition is employed, and the engine transmits the power through a leather cone-clutch and four-speed gear-box to a live-rear-axle.

Among other new cars of moderate power is the West, which is shown by West, Ltd., who have both a car and a chassis on view. These have 16–20-h.p. and 20–22-h.p. Aster engines respectively, and one of the principal features is the clutch, which is of the plate type. It has two loose plates on the clutch-shaft and one on the engine-shaft, thus there are four friction surfaces in contact when the clutch is being engaged.

Another new live-axle car is the Westminster, which has a 20-h.p. engine and a three-speed gear-box. It has been designed more especially for landaulette bodies and town use. The same firm, however, show a chain-driven vehicle for touring.

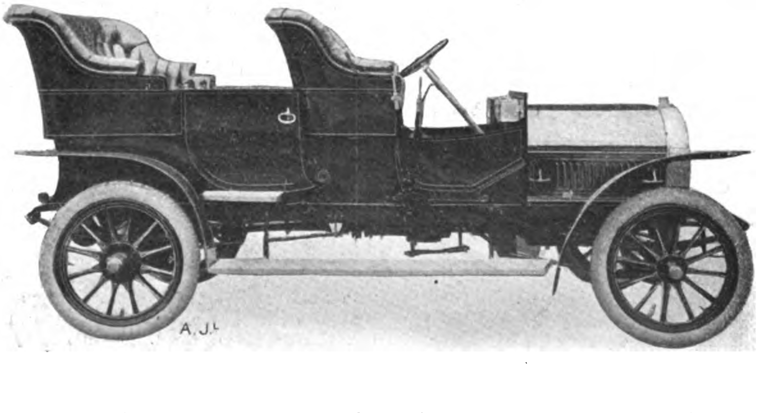
Although Metallurgique cars themselves are not new to motorists in this country, they are now shown for the first time under a new agency—that of O. Cüpper. Probably a more complete range of cars is shown on this stall than on any other in the Hall, for no less than seven models of all sizes between 12-h.p. and 80-h.p. are on view. Some modifications have been made in the design since we described these vehicles in our issue of May 13th, 1905, and a new carburettor is now fitted which has a special dash-pot control on the automatic valve.

Six-Cylinder Cars.

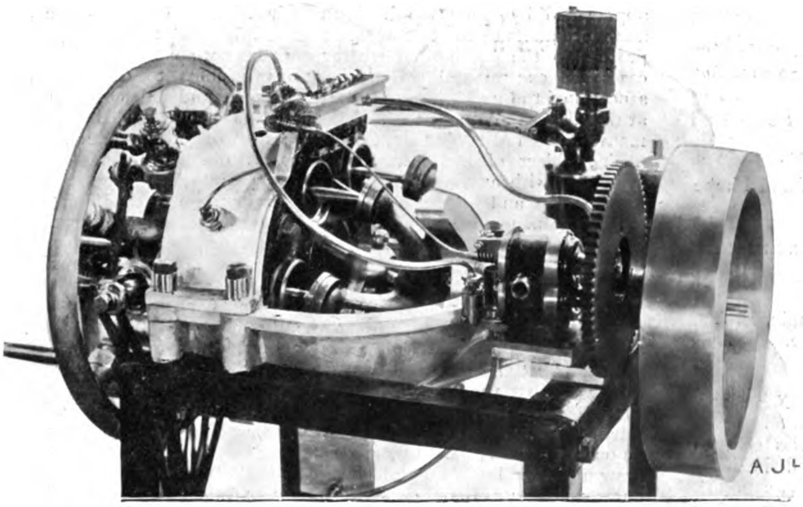
Six-cylinder cars are also well in evidence, one of the most important additions to the ranks of recent date being the new Hotchkiss which Mr. J. J. Mann, chairman of the Company, brought over from Paris on Monday last. It is, of course, now in the hands of the London-Parisian Motor Company, by whom it is being used to give trial runs. Then there is the new Humber car, which we are now describing in our columns, and the Elswick Company are also showing a 6-cylinder model. The large 6-cylinder chassis of the Thames Engineering Company has already been referred to, but in the gallery the Yukon Engineering Company show an 18–22-h.p. 6-cylinder Malcolm engine, but it is not fitted to a chassis. Although it cannot by any means be placed among the category of touring vehicles, the 160-h.p. Cottereau racer must, nevertheless, be numbered among the exhibits of 6-cylinder models; it is certainly one of the largest engines ever fitted to a chassis.

Small Cars.

As generally happens at the Agricultural Hall Show, there is quite a number of small cars of the two-seated



AGRICULTURAL HALL SHOW.—The West Car, one of the new models exhibited for the first time. It has a four-cylinder engine and is of the live-axle type; one of its special features is the clutch, which is of the double plate type.

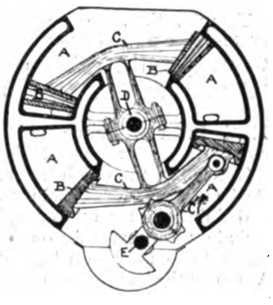


AGRICULTURAL HALL SHOW.—One of the "freak" exhibits—the Lege Engine. It is a six-cylinder engine, the piston rods operate upon a common crank through an intermediate member which provides a kind of wobble motion. In principle it is similar to an original steam lurry which we described as long ago as August 30th, 1902.

type. Most of them are miniature copies of standard high-powered cars, and there are comparatively few which exhibit any originality in design. One of the most interesting this year, however, is the Sizaire and Naudin, a little vehicle which was first exhibited at the last Paris Salon, and is now in the hands of T. J. Harman and Co. in this country. It has a wooden frame, which is carried by a transverse spring in front; the change-speed-gear is arranged in the back axle casing, and the engine transmits its power through a single plate clutch and a long propeller-shaft (see AUTOMOTOR JOURNAL, Dec. 30th last).

Friswell, Limited, have a new light car—the "Baby Friswell"—which has a pressed-steel frame, a 6½-h.p. De Dion engine, and a three-speed gear-box giving a direct through drive to the live-axle on the top speed. Natural, or thermo-syphon, cooling is relied upon, as it is also in the Reyrol and Gregoire light cars. The British Engineering Company also show a light car, fitted with a single cylinder engine and live-axle drive. It has a three-speed gear-box, in which the wheels are always in mesh, and an interesting detail is the fitting of the starting handle on the dash, so that the engine may be set in motion from the seat. On the Newmobile car, the gear-box is combined with the crank-chamber, and the two forward speeds are obtained by means of a two-way cone-clutch, which can either give a direct drive or couple up the propeller-shaft to the engine through the half-speed lay-shaft. Another original design is embodied in the Fairfax light car, which has a 2-cylinder engine placed well in front under the floor boards. An epicyclic type of gear, providing three forward speeds, is enclosed in an oil-tight gear-box, and the live-axle is driven by a propeller-shaft. Altogether the general design has a unique appearance, and it has had the effect of making a side-entrance body feasible on a very short frame.

Some Novelties.

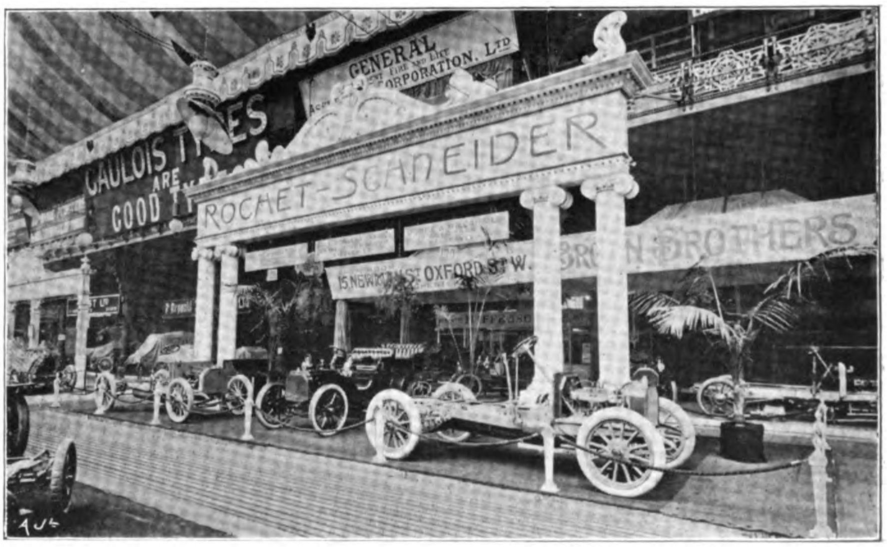


There are some very peculiar devices at the Show, and some of them are of an extraordinary freakish nature. For instance, there is the Primat engine—a French invention—which, as our illustration shows, has four *curved* cylinders, A, arranged in the form of a circle; the four pistons, B, are connected together by a member, C, which oscillates about an axis, D, the crank-shaft, E, being operated from this member by the connecting-rod, C^1, as shown.

Another of the freaks is the Lege engine, which has six cylinders set around, and parallel to a common axis, as seen in our illustration. The cylinders are stationary, and the piston rods are all connected to a pivoted casting, which operates the crank-shaft by "wobbling" round eccentrically (gyrating) as one after another of the six piston-rods tips over the casting.

The Green engine has some peculiar details, although it is, in the main, of orthodox design. The valve push-rods are operated by a set of concentric rock-shafts, which are actuated by one very short cam-shaft placed in front of the engine.

An original departure in gears is exhibited on a Gregoire chassis. It is known as the Scowen gear, and its feature is that the clutch-pedal itself is used to change the speeds instead of a side lever. An indicator is fitted below the steering wheel so that the driver can select the speed in advance, and the gear itself is of the ordinary sliding spur-wheel pattern.



AGRICULTURAL HALL MOTOR SHOW.—Messrs. Donne and Willans' Stand, upon which the Rochet-Schneider Cars—represented by this firm in England—are exhibited.

CORRESPONDENCE.

. *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

INLAND REVENUE CHARGES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The enclosed correspondence will explain itself and I hope you will be able to publish it in your paper.

Yours faithfully,
Temple, E.C. DOUGLAS LEECHMAN.
March 23rd.

[ENCLOSURE.]
1, Crown Office Row, Temple, E.C.
14th March, 1906.

To the Inland Revenue,
Somerset House.

GENTLEMEN,—With reference to Inland Revenue Form 132, Declaration for Establishment, Motor and Dog Licences, on page 4, in defining the term "motor," it is stated that "the duties charged include those payable on a 'Light Locomotive' as defined by 'The Locomotives on Highways Act,' 1896 (59-60 Vict., cap. 36). A motor that weighs not more than one ton, or upwards of five tons, unladen, is not a 'Light Locomotive' within the meaning of the Act."

While agreeing that, as a rule, motor vehicles weighing upwards of five tons, unladen, are not "light locomotives" within the Act of 1896, I am not aware that a motor car weighing not more than one ton is also outside the definition referred to, and I shall be obliged if you will kindly favour me with your authority for this assertion. If it be correct, the inclusion of motors weighing unladen not more than one ton, under heading Carriages (b) (1) (3), on page 1 of the Form, is in error, and the appended duty of £2 2*s.* is not payable thereon.

Yours faithfully,
(Signed) DOUGLAS LEECHMAN.

Inland Revenue, Somerset House.
20th March, 1906.

SIR,—I am directed by the Board of Inland Revenue to acknowledge the receipt of your letter of the 14th instant, and to express their thanks to you for calling attention to the matter therein referred to.

I am, sir,
Your obedient servant,
(Signed) J. G. BYRNE,
Douglas Leechman, Esq. Asst. Secretary.

TRAINING OF MOTOR DRIVERS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The question of thoroughly initiating motor drivers into the mechanical side of motor car construction, as well as the care and repair of motor tyres, which is equally, if not more important, is engaging a great deal of attention from the trade and outside Press, and we would take this opportunity of saying how heartily we endorse the views which are being expounded on this subject.

The public, of course, is now pretty cognisant of our demonstrating departments, where any person may call at any time without appointment and witness tyre repairing in progress, and we are bound to say that these departments have been the means of conveying very useful knowledge to many, among whom may be included the chauffeur or motor driver, who has consequently become a more valuable employee.

It is perfectly obvious, of course, that we did not inaugurate these departments with philanthropic motives, and we by no means desire to conceal the truth, which is that they were primarily established for commercial gain, and the fact that they have assisted our business in a marked degree, may be taken as proof that our appliances and our methods are right. At the same time we maintain that these departments have been of very great assistance both to the motor trade and the motoring public. They have been the means of spurring others to start tyre repair departments on their own account. His Majesty's War Office, for instance, have such a department in connection with the Army Service Corps, and many Government officials have visited us in order to gain the necessary knowledge and appliances wherewith to start demonstrating or tyre repair departments for their own particular staffs.

To give you an idea of the interest evinced in the thorough education of the chauffeur or motor driver, we are continually being approached by technical schools and educational bodies to send an appliance and an expert demonstrator to explain the tyre repairing process to the pupils, and wherever we are not appealed to (such cases are exceptional) we make it our business to obtain the sanction of the authorities to place a vulcanizer and a demonstrator at the disposal of the school. The Battersea Polytechnic is one of many similar institutions already in possession of our appliances.

The object of this letter, however, is more to express our sympathy with a movement which largely concerns the purse of the motorist and his personal safety, for in the matter of motor car maintenance we think it will be granted that tyre repairs constitute the most money-absorbing item of expenditure, and one which the efficient education of the chauffeur would very materially reduce.

While our free demonstrating departments are open to all-comers, will you kindly give us the privilege of stating that our co-operation is quite at the service of any institution that aims at producing better educated drivers (in motor matters), and that any assistance that we can give is given entirely at our own expense. Although in this proposition you may see some motives of self-interest, we think you will agree with us that the gain is not wholly on our side, but is shared by those who are privileged to continually draw upon our increasing knowledge and experience, and who have unrestricted *entré* to our demonstrating departments.

Trusting you will appreciate the sincerity of this letter, and thanking you in advance for the favour of insertion.

We are, sir,
Yours faithfully,
HARVEY FROST AND CO., LTD.,
H. HARVEY FROST,
Managing Director.
39, Great Eastern Street, E.C.
March 24th.

BRITISH OUTPUT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Our notice has been called to the publication of a letter from Mr. S. F. Edge on above subject. He divides his estimated statistics into three lists, A, B, and C. List C. is particularly interesting to us, our name figuring as the penultimate one in eight with a combined monthly total of £8,000. We say the figures are misleading.

We do not pretend to enjoy an output to the extent of Britain's largest motor manufacturers, *e.g.*, Daimler or Argyll, but as our turnover is probably at least equivalent to the Napier, it is as humiliating as it is misleading to be classed in the category of eight firms whose combined output is estimated at only £8,000 monthly.

We are ignorant of the "excellent reasons" by which Mr. Edge computes the figures, but accuracy of his statistics is possibly of less concern to him than the repeated publicity of his signature.

Yours truly,
THE REX MOTOR M'F'G CO., LTD.
Coventry, March 26th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Our attention has been drawn to a letter in your last issue from the pen of Mr. S. F. Edge, in which he endeavours to justify his estimate of the value of the output of British motor cars during the month of January. Although Mr. Edge has mentioned this firm, he has not had the courtesy to approach us in the matter, but has included our name in a list of firms having, according to his estimate, a combined output during the month of January of £6,000.

In these circumstances it may surprise Mr. Edge to learn that the value of our output during January was £3,400, an amount which was only exceeded by three of the manufacturers given in List B in his letter.

Yours faithfully,
March 23rd. WEST, LIMITED.

Re RENAULT PATENT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The Paris correspondent of the Alliance informs me that some difficulties have sprung up in consequence of the claim put forth by Messrs. Renault Frères' legal adviser, who, in each deed of the special licence wished to modify the sense of certain clauses of the general agreement.

He particularly wanted to make each licensee acknowledge the validity of the Renault French patent. The licensees very strongly object to doing so; they consider it is sufficient to admit that they have employed on their chassis transmission mechanism, which, according to the decision of the French Court, infringes the Renault patent. This is a very different matter, for if each licensee now admitted the validity of the patent, he would be bound until the expiration of the patent, even if it should afterwards be declared void.

Likewise in the rough draft of the special agreement Messrs. Renaults' legal adviser subordinated the cancellation of the licence agreement to the complete annulment of the Renault patent, but French Courts seldom give a judgment declaring the whole of a patent null and void, it may still remain of value for certain particular points; this is the reason why it is necessary to maintain the clause stipulating that the patent can only be annulled for the provision in question, and which has been reproduced for the licensees.

Out of the fourteen signatories to the general agreement two only have signed the special deed of licence.

Yours faithfully,
March 26th. J. B. KING, Secretary,
British Empire Motor Trades Alliance.

GUARANTEES AND ENGINE RATING.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The majority of boys when they are young go to the baker who sells the largest bun for a penny. When they grow older—unfortunately, perhaps, for the vendor of the cheap bun—they discover that even a bun can be baked in several ways, and be made of material of different quality. I suppose there are a certain number of people who go through life believing that they get the best value for their money if they obtain the largest bulk, irrespective of quality, and I can only presume that your correspondent is one of these.

I am afraid, however, he must be greatly annoying some of the manufacturers whose cars he mentions by saying that, although their cylinders give a larger cubic capacity, yet their cars do not sell at the same price as the 6-cylinder Napiers; and I think it now remains for him, in fairness to these manufacturers, to explain whether this is due to want of efficiency, or in what ways the cars are inferior to the Napier, Mercedes, Panhard, Bollée, Renault, and other leading makes whose names he does not mention. Also why the manufacturers he mentions charge so much higher for cylinder capacity than say, the Winton, who sell a chassis at £500 with a cylinder capacity of 355 cubic inches, which, according to your correspondent's argument, proves that the manufacturers of the Maudslay, Siddeley, Daimler, Itala, and Dietrich are charging far too much for their cars.

It surely should be clear, even to your correspondent, that motorists are able to discriminate between mere size of engine as compared with superior design, workmanship, and material, and that they evidently do not agree with your correspondent that cars should be sold according to the cubic capacity of their cylinders.

I note that he now admits the inaccuracy of his statement that the 6-cylinder Napier gives 30 h.p., and I can quite understand that one who has evidently so little knowledge of the use of 6-cylinder motors was surprised at one of comparatively small capacity giving such a large horse-power.

As I see many others have pointed out your correspondent's mistakes concerning the horse-power and prices he quoted for the 6-cylinder Napier, I need only advise him to try and be more accurate for the future before he "rushes into print," and obtain some little knowledge of his subject, as he states his belief that there are only four manufacturers making 6-cylinder engines, whereas the success of the principle of using six cylinders has been so universally realised by the leading manufacturers that there are now no less than 37 factories turning out 6-cylinder motors, some of whom will, no doubt, be able to give a three years' guarantee with those cars when they have had sufficiently long experience, and brought them to such perfection as is found in the Napier.

Yours truly,
March 24th. B. JOHNSON.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have read with some interest the letters appearing in your columns from Mr. Weigel and various supporters of the Napier car. May I point out to Mr. Weigel that the term "horse-power" signifies a *rate* of working, and that it is a complete fallacy to argue that a cylinder of 10 cubic inches piston displacement, which is what Mr. Weigel means by his expression "cubical inch contents," must give 1 h.p. He entirely neglects piston speed, which is perhaps *the* most important factor, next to piston area, in determining what horse-power an engine will develop.

With regard to the calorific value of petrol, surely, Sir, Mr. Weigel does not contend that even the best of modern engines utilises all the heat units in a given quantity of petrol in useful work, and therefore it is quite possible by improved design to obtain more power from a given volume of mixture though its calorific value be constant.

Yours faithfully,
ERNEST DE WILTON.
March 25th, 1906.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—*Re* Mr. Weigel's last letter in your excellent journal. Perhaps it would be well if your correspondent would (I might quote his own words) "before rushing into print," take steps to improve his mensuration with regard to cylinder volumes. When a person supposed to be well up in the motor manufacturing world "is showing his absolute ignorance" by saying that the stroke of an engine has nothing whatever to do with cubical capacity of the cylinder, is it a wonder that the (engineering) public at motor shows hear such funny tales at some of the stands? And then to state that cubical contents *are* measured by the area of what *it* contains! I might, for that misled gentleman's benefit, quote that threadbare rule for finding the volume of a cylinder *i.e.*, $\Pi r^2 H$, where Π is the symbol for the ratio of the diameter to the circumference of a circle, r the radius, H the height of the cylinder (in this case the stroke). If what Mr. Weigel says is true, and they lengthened the stroke, the compression space being constant, I should have a hard time.

Yours faithfully,
PISTON HEAD.
Rugby, March 24th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—This Weigel controversy seems to be getting on people's minds and colouring the trade. It was my unfortunate lot to overhear a further conversation in the future, and give it in case it may interest Mr. Weigel:—

Chaotic Customer: Do you keep the new Weigel cubic inch-stroke-neglected motors?

Bewildered Salesman: I am not quite sure what you mean, sir.

Chaotic Customer: I mean the new Weigel type that has merely breadth or area to constitute its cubic capacity, but no length.

Bewildered Salesman: Merely area?

Chaotic Customer: Yes. You see it is like this. I am not to be put off with a stroke in my engine. I want one all "area," so as to have a lot of the new Weigel cubic inch capacity.

Bewildered Salesman: I am very sorry, sir, but fear you—

Chaotic Customer: Oh, yes! I know what you are going to say. All that rot about the cubic capacity of the cylinder being the area of the piston multiplied by the length of the stroke; and so did I think so until recently, but Weigel says it is not so. So even if it is, how can it be?

Bewildered Salesman I am afraid our motors follow natural laws. Are you sure Mr. Weigel is well?

Chaotic Customer: Well, I have heard it suggested that he is at present suffering from the bacillus penalti guaranteeum, and valiant efforts are being made to discover a foreign antitoxin, as the foreign trade prospects are upsetting his nervous equilibrium.

Bewildered Salesman: I am sorry we cannot oblige you with a Weigel a(e)r(e)ated motor.

Yours faithfully,
March 24th. J. LAMBERT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have been extremely interested in following the discussion in your columns with regard to engine rating, and I hope that you will not consider me hypercritical if I take exception to some of the statements made by Mr. D. M. Weigel.

He calls Mr. Lambert severely to account, and, moreover, assumes a pedantic attitude towards him for stating that the cubical "inch" contents of a cylinder depend upon the stroke. In the first place Mr. Lambert did not make use of the term "cubical inch contents," and certainly he was right in assuming that the length of stroke affected the cubical contents.

Now to take Mr. Weigel's own statement, "that cubical contents of a cylinder are measured by the area of what it contains," this is really so far beyond my ken that I had to refer to the dictionary to find the meaning of the word "area," and I found the definition to be "the *superficial* contents of any figure."

I do not know whom Mr. Weigel refers to as "we," but the "we," of which I am a unit, look upon area as a measurement derived from two dimensions, and cubical contents a measurement derived from three dimensions. We have also been in the habit of considering that the cubical contents of a cylinder are not the correct data to employ for the measurement of horse-power, for we have preferred to take the cubical contents of the space swept by the piston, which we used to obtain by multiplying the area of the piston by the length of its stroke.

We also found another factor, and that was the piston displacement per unit of time, but perhaps most important of all, as it meant so much both to maker and user, was the mean effective pressure of the cycle. These factors, together with the mechanical efficiency, gave the effective horse-power.

From the customer's point of view, the factors that he requires to determine the comparative value of the machine are effective horse-power between the practical limits of speed of his vehicle, the prime cost of the machine, and the amount of money that will have to be spent to keep the machine in running order.

If I were buying a balloon I should consider Mr. Weigel's suggestions excellent, but for internal combustion engines I am afraid they hardly meet the case.

Yours faithfully,
ARTHUR F. EVANS.

March 24th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I feel sure that a number of motorists who—like myself—are not connected with the motor business, must have been impressed by the heated discussion in the British and Continental Press, which has followed the two bombshells Mr. S. F. Edge has apparently launched into the midst of motor manufacturers and dealers. I mean his two guarantees to those who order 6-cylinder Napiers, firstly, to pay £20 per week if a car is not delivered on the date promised, and, secondly, to guarantee these cars for three years.

So far, the only people who have had anything to say on the subject are others in the trade, who, for reasons of their own, are unable to give these guarantees. One says he thinks they are unnecessary, and only mean risk to the manufacturer; another says his cars do not need a guarantee; a third says that, of course, anyone could give these guarantees (but he does not do so himself); whilst the only explanation another gives is, that Mr. Edge does not really mean it.

Now these appear to be merely excuses to shirk the main point. All those who sell motors state that their particular car is the most reliable and the best; this is no proof, and Mr. Edge has got ahead of them all on business lines. He has met his customers on two most vital points.

What automobilist has not raved in his annoyance at losing the best of the season because he has had to wait weeks—and even months—beyond the date his new car was to be delivered, and how many of us can remember running a car for three years without a repair bill (usually a heavy item in running expenses most of us have found), or which of us have heard or know of a manufacturer who would complacently repair his client's car free of charge because it had not been running for three years.

It seems to me that we, as buyers, who are after all the principal people to be considered, should give our views on this important subject, and insist now on manufacturers who consider their cars worthy to be classed amongst the leading makes giving us written business guarantees such as Mr. S. F. Edge can give with the Napier, whether such makers consider guarantees are necessary or not—we shall then know both when we are going to get our new cars delivered and how much our repair bills will be. I enclose my card and remain,

Yours truly,
H. CARTER.

March 24th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With reference to Mr. Weigel's letter appearing in your columns, I think he is rather out of his depth now, and would perhaps appreciate a few hints as to the mensuration of a motor car engine cylinder. When I was at school I learnt the following rule or formula for measuring the cubical inch contents of a cylinder, viz. :—

$$D^2 \times .7854 \times L \text{ where}$$

D = diameter of cylinder.
L = length of cylinder (corresponding to the stroke in an engine).

But Mr. Weigel says no; he maintains that the length or stroke has nothing to do with the cubical inch contents; perhaps he would be good enough to give your readers his formula for measuring or calculating the cubical inch contents of the various engines he has mentioned. Strange to say, my formula gives exactly the same results as Mr. Weigel's, but he does not count the stroke, whereas I do. In his letter he says, "that the cubical inch contents of a cylinder are measured by the area of what it contains." This seems rather vague, so perhaps Mr. Weigel will tell us what it does contain. Assuming, however, that he means motor car engine cylinder, containing the usual piston, does he mean to say that the cubical inch contents are measured by the area of the piston without taking the stroke into consideration at all. If so, I should be pleased to know how he does it, because his own figures do not agree with his mode of calculation, as the following comparison will show. We will take the Napier and Maudslay 6-cylinder engines, they both have 4-inch bore cylinders. According to Mr. Weigel, the stroke does not count, so then we get the cubical inch capacities from the area alone (by Mr. Weigel's rule), which is 75·398 for each engine. As Mr. Weigel in his list gives the Napier 300, and the Maudslay 380 cubical inch contents, perhaps he can explain the *slight* difference.

Again, does Mr. Weigel suggest that an engine with a single cylinder of 4-inch bore and 4-inch stroke is equal in cubical inch contents to an engine with 4-inch bore and 10-inch stroke? If so, then I should in all seriousness advise Mr. Weigel to have a few minutes' conversation with a technical engineer, who will, no doubt, inform him that the theoretical horse-power of all internal combustion engines is arrived at from a basis of piston area and piston speed per minute, and not from the cubical inch contents of the cylinders. In conclusion, I should like to mention, for Mr. Weigel's benefit, that I am in no way connected with Messrs. S. F. Edge, Ltd., or Messrs. Napier and Son, but am employed by a firm of motor car manufacturers who only manufacture 4-cylinder engines. Trusting you can spare me some of your valuable space for the publication of this letter.

Yours faithfully,
ARTHUR CLIFFORD EARP.

March 24th.

P.S.—Perhaps Mr. Weigel will tell us whether he includes the cubical inch contents of the combustion chamber in his calculations, or merely the volume swept out by the piston, as I have done.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am sorry that Mr. Maudslay should charge me with interfering with Mr. Edge's business. I have not done so.

I am in accord with him. If Mr. Edge looked after his own business, he had a perfect right to guarantee as long as he liked, and to get what price he likes. But I would remind Mr. Maudslay that I opened the correspondence by suggesting that the proposition that the trade should follow him (Mr. Edge), was a bad one, coming from him, inasmuch as he was charging so much more for his goods than his competitors, who, in comparison, could not afford to follow his lines, and apart from which they were were giving just as good value without the three years' guarantee as Mr. Edge was giving with it, inasmuch as he charges for it. Had Mr. Edge looked after his own business I should certainly not have interfered with it.

Coming to a much more important point that Mr. Maudslay raises, that is, what horse-power the public are desirous to be acquainted with.

After eleven years' experience, and after having sold several thousands of vehicles, I am of the opinion, in fact I am sure, that the only horse-power the public are interested in is that which an engine develops at its maximum load. Or in other words, it would be a dynamometer test, and if, for example, upon the dynamometer an engine could carry a load of 40 h.p., that is what the public is desirous of knowing. I am quite sure Mr. Maudslay agrees with me. If I read his letter aright, he wants somebody else to say so that the burden of having said so should not fall upon himself, standing as he does in the position of a manufacturer. I fully appreciate Mr. Maudslay's desiring to take a very right and proper position. It is absurd, and here again I agree with Mr. Maudslay, that to suggest that because an engine will turn two thousand revolutions light, that it is possible to work out on paper that she is double the horse-power of what she is when actually working and carrying a load.

There is one other curious remark that Mr. Maudslay made in answer to Mr. Johnson. He states that he is of the opinion, and I am sure he must be correct, that the Napier car is only developing 30 h.p. when fitted with an ordinary gear, and therefore doing its maximum work.

When the car is fitted with a lower gear (as I understand it has been for the purposes of demonstration), the engine is, in fact, only developing sufficient power to carry the smaller load, and therefore in actual practice with the lower gear upon it, it is developing at the time less horse-power, and the excess which it may be capable of is simply in a state of inertia.

Yours faithfully,
D. M. WEIGEL.

March 24th.

RACES, RECORDS, AND TRIALS.

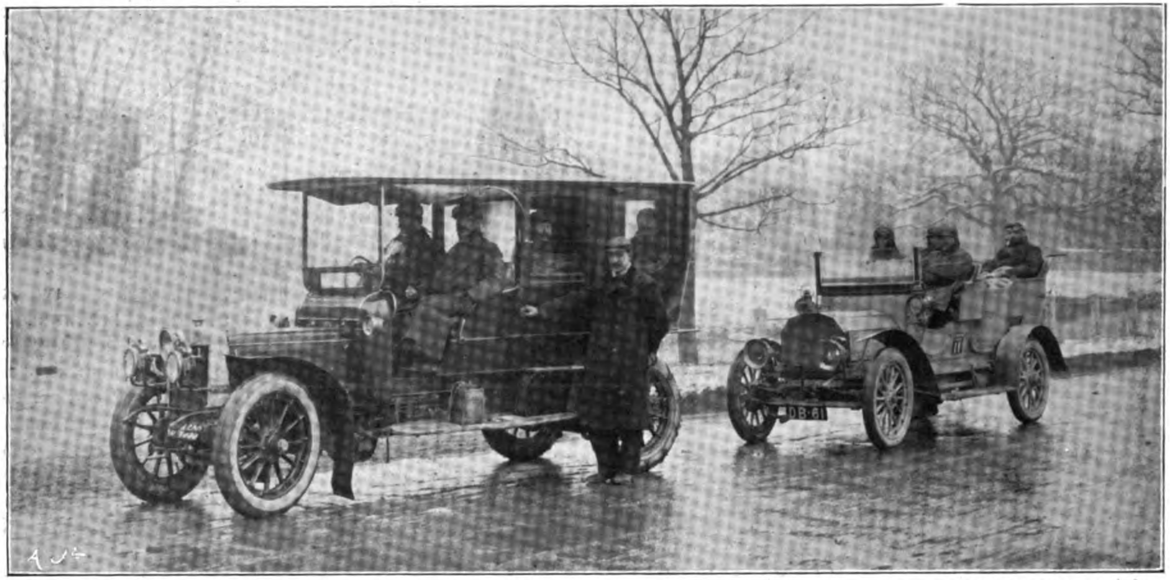


Photo by Argent Archer.

TYRE, SPEEDOMETER AND LAMP TRIALS.—The first day of spring! A wintry experience at Staines on the 23rd day of the Trials.

A.C.G.B.I. Tyre, Lamp, and Speedometer Trials.

During the week ending Saturday, March 24th, the Dennis car made non-stop runs every day, and thus brought the aggregate mileage up to 3,417 miles. An extraordinary incident characterised the run on the 23rd inst., for when travelling between Newbury and Hungerford an ostrich—of all things in the world—came racing towards the car at a tremendous speed, only swerving to one side when a few yards from the vehicle. At first the occupants thought the ostrich would charge full tilt against the car, but, as a matter of fact, the bird did not even stop to look at it. The following is the week's record for the various entries :—

Collier Tyres.—36-in., one burst; 34-in., one puncture; 815-mm., non stop up to Friday, when car was damaged in avoiding a collision with a pedestrian.

Speedometers.—Staunton and Cowey, non-stop. Elliott and Kirby, non-stop up to Friday, when car was damaged as stated above.

Worsnop Headlights.—One or other of the lamps had to be relighted occasionally, owing to vibration, loose burner, &c.

Tail Lamps.—Metallic mirrors not lighted on 22nd, but burnt well on other days. Ryta and Hoult went out four times.

Sneden Cup.

For the second year M. de Malglaive has secured this cup, offered by the Algerian A.C. for the best time over the kilometre. M. Malglaive's time this year was 35⅕ sec., his car each year being a Lorraine-Dietrich.

Mont Cenis Climb

Has been fixed to take place on July 15th, as usua under the auspices of the Turin A.C. The categories provide for light and heavy racing cars and for twelve-seated motor omnibuses. Tourist cars are barred from taking part in this 23 kilom. test.

MOTOR CYCLING.

Silencer Competition.

The sub-committee of the Auto Cycle Club appointed to consider this competition has decided to obtain for the purpose of the trial a 3½-h.p. water-cooled engine, running at a speed of 1,500 revs. per min., and with an outside fly-wheel, if possible. This engine will be fixed up in some testing shop, which it is hoped to obtain for the purpose of carrying out this trial, and the judges, in arriving at their decisions, will take into consideration :—Back pressure, noise, facility of attachment, weight and strength, capacity, means of cleaning and maintenance, and cost. Drawings of each silencer to be submitted for trial must be sent in beforehand.

Limit of Cylinder Capacity for Racing.

A sub-committee of the Auto Cycle Club, consisting of Messrs. H. B. Renner, H. A. Collier, J. A. Prestwich, F. J. Ellis, and R. A. Osman has been appointed to consider the advisability of increasing the limit of cylinder capacity for engines used in racing on enclosed tracks.

International Cup Selection Trials.

Owing to the date of the race for the International Cup in Austria having been postponed until July 8th, it has been decided by the Auto Cycle Club to extend the time for receiving entries for the English Selection Trials until Wednesday, April 18th.

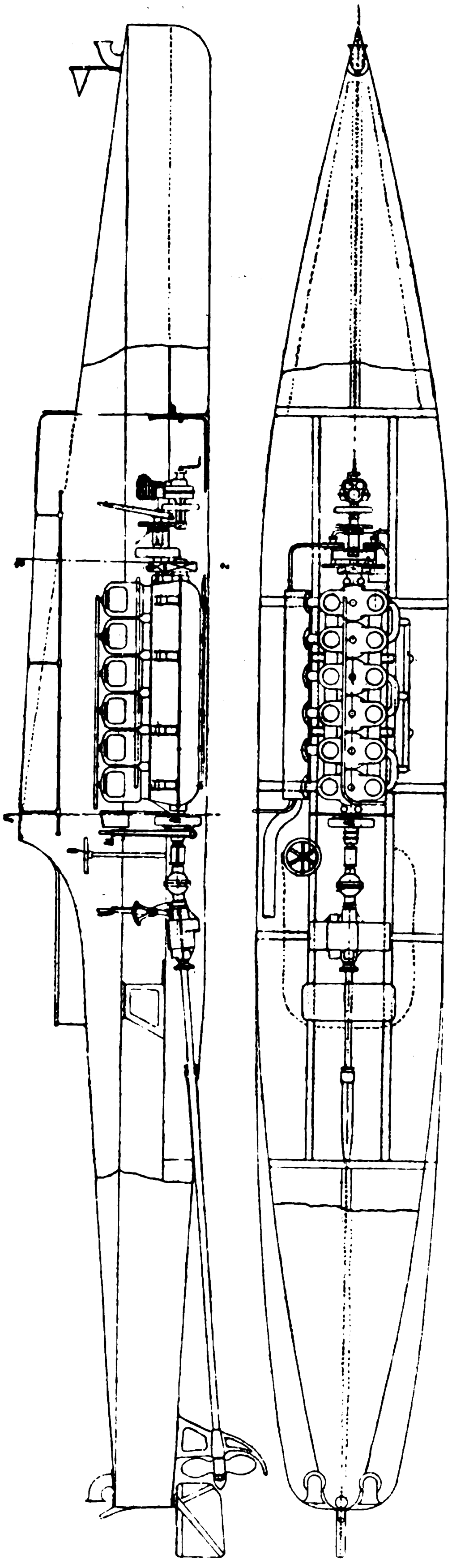
Quarterly Trials.

The next Quarterly Trial of the Auto Cycle Club will be held on Wednesday, April 25th, starting from the Chequers Hotel, Uxbridge, at 9 a.m. The route will be the same as that used in the last Quarterly Trial. A certificate of the actual performance will be given for each machine competing, and special certificates for those making a non-stop performance.

Motor Cycle Competitions.

Permits have been granted for the following motor cycle competitions to be run under the open competition rules of the Auto Cycle Club :—

April 7th.	Southern M.C.	Open Hill Climb.
April 15th.	Essex Beagles.	Five Miles Handicap.
April 16th.	Bury St. Edmunds.	Five Miles Handicap.
April 16th.	Canning Town.	Motor Meeting.
April 21st.	Hertfordshire A.C.	Open Hill Climb.
May 5th.	Anerley B.C.	Five Miles Invitation Race.



Side Elevation and Plan of Lord Montagu and Mr. Lionel de Rothschild's Napier-Saunders Racing Boat, "Siola," which is to compete at the Monaco Meeting.

MOTOR BOATING.

Siola.—Lord Montagu and Mr. Lionel de Rothschild's new Napier Racing Boat.

AMONG the craft which will represent England at the Monaco Regatta next month is the new Napier racer Siola, which has been built for Lord Montagu and Mr. Lionel de Rothschild. One of its most notable characteristics is that it is a "6-cylinder boat," in which respect it differs from the Napier racing boats hitherto built, and will afford an interesting comparison with Yarrow-Napier, which we described March 17th.

Owing to the delay in transit, boats have to be despatched to Monaco very much in advance. Comparatively little time was available for lengthy testing, and we are unable, at present, to publish any photographs of the complete boat. In our issue of February 10th, however, we gave photographs of the engine, and we now supplement these by drawings showing the approximate general lines of the boat.

Designed by Mr. Linton Hope, the hull has been constructed, on the Saunders principle, of four skins of mahogany. The overall length of the hull is 11·98 metres (39·4 feet), and the beam is 5 feet. Along the whole length of the boat, run the two wooden engine-bearers from which the hull derives most of its rigidity. Amidships, these bearers are 16 inches deep, but fore and aft they taper down to 6 inches. At intervals they are tied together by the oak floor frames. A turtle deck covers the fore part of the boat, and the after end is also completely decked in. In the centre is a cockpit 14 feet in length, containing the engine and crew space, and the forward part of this is covered with a permanent hood as a protection to the machinery.

Very fine V sections characterise the fore part of the hull, and these merge through the easy rounded midsection into a perfectly flat run. The greatest beam is well aft, and the engine is placed forward of the centre of buoyancy in order to keep the bows down when at speed. The engine itself is fixed with its crank-shaft horizontal, the angularity of the propeller-shaft being compensated for by a universal joint.

British Boats for Monaco.

SPORT-LOVING Englishmen generally, and in particular motor boatists, who desire to see the motor boats of this country distinguish themselves abroad, will feel sincere sympathy with the owners of the Napier racing craft, in the extreme ill-luck which has victimised them in connection with the approaching Monaco Motor Boat Meeting. In order to be in time for this event, which was originally to have commenced on the 31st, it was found necessary to ship the Yarrow-Napier, and Siola (the latter described above) by the small packet-boat Herefordshire, a vessel not really suited for transport of this description or to weather very stormy seas. The result was that in the Gulf of Lions a huge wave broke on board and drove the Yarrow-Napier boat in its cradle against a capstan with extreme violence. The cradle in which it was accommodated was twisted up like a piece of paper, and the slinging irons bent right over the boat, the hull of the boat itself being stove in in two places, while the Siola had her turtle deck lifted and her coaming torn away. It is feared that the serious damage to the Yarrow-Napier will render it impossible for the boat to take part in the

Monaco races, though the damage to the Siola, being slight, will probably be repaired in time. One thing is certain, if human effort can remedy the damage, both boats will be set right to represent Great Britain at the meeting. With that object, after news of the mishap arrived, Mr. Saunders and Mr. Seaton Edge immediately left for the South, accompanied by a gang of workmen.

Now here is where the hardship comes in. At the last moment, and after the boats had been got under way on board the Herefordshire, the authorities at Monaco postponed the closing date from the 31st of March to the 4th of April, for what exact reason we know not; but it may be allowable to surmise that it was with a view of enabling French competitors, who would not have been ready at the earlier date, to put in an appearance. Had the fixture been for the 4th in the first instance, Mr. Edge could have shipped the boats on board a large sea-going vessel, and in all human probability no injury would have happened to them. A date once fixed for an event of this kind ought to be absolutely adhered to. Alterations of this kind in international racing events are but too likely to affect foreign competitors most unfairly.

In regard to Brooke I, which was entered by Mr. J. Mawdsley Brooke, of Lowestoft, we regret to learn that it has been decided to withdraw this craft. This course has been deemed the wisest, as certain experiments which have been carried out in working a new carburation system have not been as completely successful as was hoped, and rather than risk failure, it has been determined to stand aside from this year's races.

Ill luck appears to be already in the track of the boats again this year, as the Austrian (Wiener-Neustadt) Mercedes has had a nasty accident off Antibes, when practising. By some means during the run she broke her rudder, drifted on to the rocks, and sustained bad damage—not, however, so serious as to destroy the hope that she can be repaired in time for racing.

Notable Boats at Monaco.

SEVERAL of the motor boats which are to take part in the races at Monaco are remarkable as instances of mechanical ingenuity, and many of them have been fitted with engines of huge size; several are, moreover, fitted with 6-cylinder engines. One of the most striking of the new craft is the Mercedes (Cannstatt-Daimler) vedette boat, which has a special 200-h.p. engine, and a Decout-Lacour galvanised steel hull about 18 metres in length. Another Mercedes boat, the "Mercedes-Paris," has two 6-cylinder engines of 170 h.p. each, these driving twin-propellers. Then there is "L'Antoinette V.," a 12-metre boat which has no less than 48 cylinders, the combined power of the "Levavasseur" engines being 600 h.p.; "Martini III.," which is an 11-metre steel boat, has a 70-h.p. 6-cylinder engine; "Dubonnet" is the 15-metre craft which won the Coupe du Prince de Monaco last year, but now has two 120-h.p. De Dietrich engines in tandem; "Caflit" has a particularly interesting "Itala" engine of 250 h.p., for it is in reality two distinct engines having a common crank-chamber for the two independent crank-shafts; and "Seasick" is another craft having an "Itala" engine—a 4-cylinder engine of 130 h.p. Another unusual type of engine is that fitted in "La Glaive," for this 30-h.p. "Kuntz" motor has four phosphor-bronze cylinders with detachable cylinder-heads.

The Royal Commission on Canals.

THE Royal Commission appointed to inquire into the canals and inland navigation of the United Kingdom, met on the 21st instant, under the presidency of Lord Shuttleworth. The first evidence, which was that of Sir Herbert Jekyll, was entirely of an historical character, and it is of interest to learn on his authority that the oldest canal in this country, the Fors Dyke, connecting Lincoln with the Trent, was in all probability constructed by the Romans. After the time of the Roman occupation, however, the canal enterprise had a long closed season, the next one of any importance dating from 1539. It was, of course, the Bridgwater canals in the middle of the eighteenth century that gave the great impulse to canal development, till our waterways fell under the paralysing influence of the railway companies between 1845 and 1850. Other witnesses called were Mr. George Stephenson, one of the Commissioners of the Irish Board of Works, who described the canal system of Ireland, and Sir John Dorrington, M.P., Chairman of the Gloucestershire County Council, who produced statistics relative to the Severn and Thames Canal.

Mr. Bernard Redwood on "Motor Boats."

ON Wednesday of last week, the paper which was read before the Society of Arts by Mr. Bernard R. Redwood on "Motor Boats," was chiefly of an historical character, and was confined to those craft which have been propelled by internal combustion engines. The chair was taken by Sir John Thornycroft, and amongst those who took part in the discussion were Messrs. Linton Hope, F. R. Simms, Seaton Edge, and A. F. Evans. Mr. Redwood traced the gradual development of boats propelled by petrol engines, since Daimler's first experiment in 1886 up to the present time, and dwelt on the many important improvements that had been made of late.

British Boat Motors in the Colonies.

SOME motor boat races were recently held at Perth, Western Australia, and both the first and third places were secured by boats fitted with Brooke motors. Considering the hold which engines of American manufacture appear to have in these parts, it is particularly pleasing to record the success of the only two English motors out of the seventeen entries. It should surely want little enterprise on the part of our firms at home to secure the major portion of the Colonial business when British goods can carry off the prizes like this.

* * * *

A Ticklish Conscience.

AN American automobilist, doubtless wealthy, was recently travelling through the Watford district when he was charged by the police with driving at 24 miles an hour. Before the day on which the charge was to be heard he had returned to America; but he has since written to the local Bench explaining that he had not left to avoid justice, and enclosing £5, which he hoped the magistrates would accept as a fine and as an appreciation of the pleasure afforded him by the delightful English roads. The Chairman of the Bench, in handing the money over to the poor box, said some English gentlemen did not behave as courteously when detected breaking the law! Yes, it *would* be nice if every car owner who fell into a police trap at once forwarded £5 to the magistrates without troubling them to call the case, much less to listen to a defence!

CLUBS AND ASSOCIATIONS.

Aero Club.

THE Right Hon. the Earl of Dundonald, C.B., C.V.O., has been elected to the Council of the Aero Club of the United Kingdom.

Auto Cycle Club.

THE Hon. Arthur Stanley, M.P., has consented to again act as the President of the club for the ensuing year. Mr. Robert Todd has been unanimously re-elected Chairman of the club, and Mr. C. A. Smith Vice-Chairman.

The Paper on "Lubrication" will be read by Mr. J. W. G. Brooker before the members of the Auto Cycle Club, at 119, Piccadilly, W., on Thursday, 26th April.

Several new members were elected at the last meeting. The committee, however, are anxious to add considerably to the numbers, and it is to be hoped that members will use their personal influence to enlist their friends who are motor cyclists as members. In addition to the advantages and privileges of membership of this club, all members are *ipso facto* members of the Motor Union, and entitled to the advantages and privileges of that body.

Automobile Association.

COL. W. J. BOSWORTH presided at a well-attended meeting of the above Association held at Cordingley's Eleventh Annual Automobile Exhibition on Monday afternoon. Among those present were the Earl of Shrewsbury and Talbot, and Sir A. J. Macdonald, Bart., J.P. (vice-chairman).

In the course of a lucid speech the chairman referred to the deplorable state of affairs in regard to police traps. He pointed out that the police had now transferred their irritating attention from Reigate to Kingston, and while they were persecuting motorists wholesale, they were allowing persons to be fiendishly cruel to animals and to escape punishment by the mildest of fines. His brief report of a recent case at Kingston, wherein a man who had nearly beaten a horse to death had been let off with a fine of 40s., was received with cries of "Shame!"

The chairman continued that the average Surrey policeman, like Mr. Toole, always appeared to be wanting to play Hamlet. The nimble burglar, thief, or wife-beater could run free while they were confining their attention to the apparently more remunerative business of extorting fines from motor car drivers. It was the Association's mission to prevent motorists from offending against the laws that be, and thus assist the police rather than retard their efforts. The chairman laid stress upon the fact that the Association was not formed to help the hooligan who scorches through villages at 20 miles an hour, but to enforce the speed limit in places where the police in ambush would invite its infringement; and thus enable them to return to their more dignified and necessary duties of safeguarding the inhabitants of villages and towns.

Sir Archibald Macdonald, Bart., J.P., briefly but forcibly endorsed the chairman's remarks, and among other speakers who made suggestions carefully noted for further consideration by the Committee were Mr. Walter Gibbons, Mr. Macaulay Mort, Mr. Thring Robertson, &c.

A thoroughly successful meeting was wound up by an excellent speech on the part of Mr. W. Letts, of Messrs. Charles Jarrott and Letts, whose proposal of a hearty vote of thanks to the Chairman, Committee, and the Secretary, Mr. Stenson Cooke, was received with acclamation.

A brief reply by the Chairman terminated the proceedings. It was mentioned in the course of the afternoon that the Association is in a gratifyingly strong position, new members to the extent of over one hundred having been enrolled during the past three weeks.

Irish A.C.

THE annual general meeting of the Irish Automobile Club on Thursday last under the presidency of Sir W. G. D. Goff, Bart., Chairman, was largely attended, the following members being present:—The Earl of Drogheda, Col. J. McGrath, Col. White, Col. Thomas. Major Wellesley, Captain C. W. Seagrave, Dr. Glynn, Messrs. R. J. Mecredy, Thomas Talbot Power, T. J. Plunkett, J. W. Chancellor, D. Watt, W. D. Sainsbury, J. C. Percy, J. B. Dunlop, jun., C. Wisdom Hely, C. E. Boyce, J. M. Davies, F. W. Perry, R. F. H. White, L. H. S. Beaty, W. J. Landy, W. S. Hages, H. B. Hill, Walter Seyton, hon. treasurer, C. White, hon. secretary, and Mr. H. S. Chaytor, secretary. The annual report was interesting, over one hundred new members being elected during the past year. The Committee reported progress with reference to the recently-acquried premises adjoining the garage, at present in the hands of the contractors, or the new club house and offices, which, it is hoped, will be ready for occupation early in May. The opening service will be performed by His Excellency the Lord Lieutenant, who has consented to become patron of the club. The arrangements entered into with the A.C.G.B.I., whereby the Irish club will in future be recognised as the governing body of motoring in Ireland, henceforth the club will have the same standing in Ireland as the A.C.G.B.I. in England. Examinations will be held under the auspices of the club for the granting of certificates to drivers and owners during the first week in April at Dublin, Waterford, Cork, Dundalk, and Belfast. An amateur reliability run, open to non-members, will be held in June, starting and finishing each day at Dublin, the distance to be an out and home run of about 100 miles per day with an open hill climb on the following day. The committee hope to conclude arrangements with the Royal Dublin Society for the use of their show grounds at Balls Bridge to hold a motor car show in January, 1907. The following were elected to the various offices for the year 1906:—President: the Right Hon. Sir Horace Plunkett, K.C.V.O.; vice-presidents: the Right Hon. the Marquess of Waterford, the Right Hon. the Earl of Drogheda; chairman: Sir W. D. Goff, Bart., D.L.; vice-chairman: Thomas Talbot Power, J.P.; committee: Humphrey Bland, T. J. Plunket, C. W. Seagrave, J. M. Davies, F. H. Hall, R. J. Mecredy, E. C. Herdman, W. B. Jamison, J. E. Goodbody, C. W. Heley, Colonel C. Knox, T. Henshaw, R. Murdock, Colonel Wellesley, Gillamore O'Grady, Colonel Thomas, S. Geoghan, H. S. Close, J. B. Dunlop, jun., B. Barrett.

The Motor Union.

THE Annual Meeting of the Motor Union was held at the Agricultural Hall on Wednesday, the chair being taken by the Hon. Arthur Stanley, M.P.

During last month 219 individual members, and one new club (the South Herts Automobile Club), have joined the Union.

Among the new members are the Right Hon. the Marquis of Salisbury, the Hon. W. F. D. Smith, M.P., Sir H. Burdett, Sir Edmund Verney, Bart., and Sir W. P. Sawyer.

The membership of the Union is now 11,300.

Society of Motor Manufacturers and Traders.

THE Annual General Meeting of the Society of Motor Manufacturers and Traders was held on Thursday, last week, at Maxwell House, Arundel Street, Strand, Mr. Sidney Straker presiding. The report and accounts, which showed that £10,000 had been invested in securities, having been unanimously adopted, the chairman stated that the position of the Society was most satisfactory, more than thirty firms having joined since January 1st. The action of the Society with regard to the British Importers' section received the fullest approval. The result of the postal ballot for the thirty members of the council was declared, the following being elected:—

Messrs. H. Austin (Austin Motor Company, Limited), T. B. Browne (James and Browne, Limited), H. C. Burford (Milnes-Daimler, Limited), G. A. Burls (John I. Thornycroft and Co., Limited), Robert Burns (Swift Motor Company Limited), T. Clarkson (Clarkson, Limited), F. Coleman (White Steam Cars), G. Du Cros (Panhard and Levassor), H. Du Cros, jun. (Du Cros-Mercedes, Limited), S. F. Edge (S. F. Edge, Limited), E. Gascoine (Armstrong, Whitworth and Co., Limited), F. Goodchild (Lacre Motor Company), A. Govan (Argyll Motors, Limited), A. C. Hills (Deasy and Co., Limited), E. M. C. Instone (Daimler Motor Company, Limited), C. Jarrott (Chas. Jarrott and Letts, Limited), C. Johnson (C. S. Rolls and Co.), H. Johnson (Joseph Lucas, Limited), F. Lanchester (Lanchester Motor Company, Limited), J. S. Napier (New Arrol-Johnston), E. Powell (Humber and Co.), P. Richardson (Brotherhood-Crocker Motors, Limited), C. Sangster (Ariel Motor Company, Limited), J. D. Siddeley (Wolseley Tool and Motor Car Company, Limited), F. R. Simms (Simms Manufacturing Company, Limited), H. Smith (Rover Cycle Company, Limited), J. W. Stocks (De Dion-Bouton, Limited), S. Straker (Sidney Straker and Squire, Limited), H. Sturmey (Duryea Motor Company, Limited), H. J. Swindley (Iliffe and Sons, Limited).

Southern Motor Club.

THE opening run has been fixed for to-day (Saturday) to the Glyn Arms Hotel, Ewell, Surrey, route *via* Morden. Tea will be served at 5.30 in the "long room," which will afterwards be cleared for a musical evening.

On Sunday, April 1st, a run has been arranged to Westcott, near Dorking (Prince of Wales Hotel), route *via* Epsom and

Leatherhead, for members to test the hill for the Open Hill-Climb on Saturday, April 7th.

Open Hill Climb, April 7th.—Entries for this climb close on March 31st., and should be sent to hon. sports sec., H. Jones, 29, Grantham Road, Clapham, before that date.

Sunday, April 8th.—Run to "The Hut," Wisley.

Easter tour to Bath, starting from headquarters to Maynard's Hotel (near Midland Railway Station), Bath.

In addition to the above, the following fixtures have been decided on for the coming season :—

Sunday, April 22nd.—Horsham, *via* Crawley (Anchor Hotel).
Saturday, April 28th.—Hill Climbing Demonstration by Quadrant Cycle Company.
Sunday, April 29th.—East Grinstead (Railway Hotel).
Saturday, May 5th.—100 Miles' Reliability Trial for cars and tri-cars.
Sunday, May 6th.—Chertsey (Bridge House Hotel).
Sunday, May 13th.—Hitchin.
Saturday, May 19th.—Inter-Club Competition (speed judging) with North London A.C. for Gamage Cup, on Bath Road.
Sunday, May 20th.—Marlow (Fisherman's Retreat).
Sunday, May 27th.—Guildford (Angel Hotel) with extension to Hindhead.
June 2nd.—Petrol Consumption Trials.
June 3rd and 4th.—Whitsun Tour.
June 9th.—100 Miles' Reliability Trials for Motor Cycles.
June 16th.—Garden Party.
June 30th.—Club Hill-Climb.
July 7th.—Gymkhana.
July 15th.—Launch Party.
July 22nd.—Inter-Club Run with Woolwich and Plumstead Motor Club.

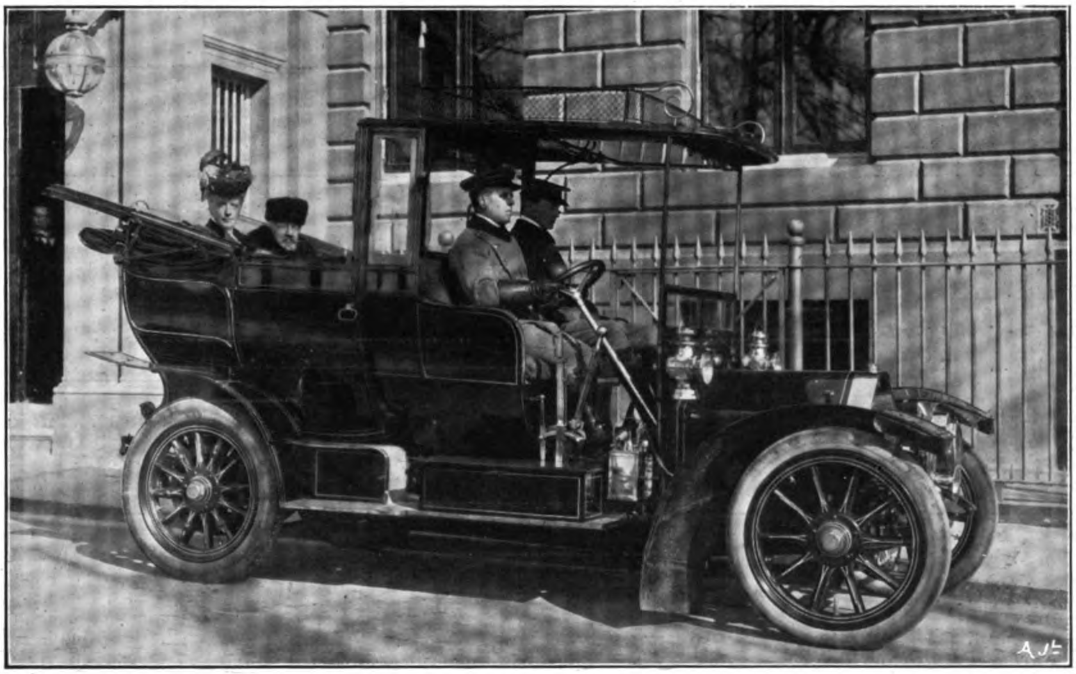
Yorkshire A.C.

THE club's season opened with a very successful Smoking Concert, on the 23rd inst., at their headquarters, the Great Northern Hotel, Leeds, when Mr. E. H. Hopper presided over a large company.

Previous to the concert, a Special General Meeting was held, at which the Halifax Automobile Club was affiliated with the Yorks. Automobile Club. The total membership of the club and its affiliated branches is now over 500.

A lecture is to be given on April 11th, by Mr. Claude Johnson, on some incidents, amusing and serious, in connection with the earlier days of motorism.

* * * *



Sir Max and Lady Waechter in their 20-25-h.p. Brotherhood Landaulette, which they have now had in continuous service since last summer. Sir Max Waechter employs his head coachman to drive this car, who found no difficulty in quickly acquiring the necessary knowledge for controlling the mechanism, which in the case of the Brotherhood is exceptionally simple, though unusual, in its operation.

AERONAUTICS.

Record for 1905.

DURING the year 1905, members of the Aero Club of France made no less than 288 balloon ascents, in which the total of 778 passengers travelled without a single accident, and the total amount of gas consumed was 9,728,680 cubic feet.

A New Recruit.

THE latest recruit to the ranks of experimenters in aeronautics on a large scale is the Duc de Guiche, who is having built for him near the Quai Michelet a fully-equipped workshop, and has taken a large space of ground for experiments in aeroplane flight. His works will comprise an automobile garage and drawing office, and a large workshop with offices and reception rooms. The whole building is being constructed by the same architect who built the house of M. Rostand, the celebrated author of "Cyrano de Bergerac," a play in which an ancestor of the present Duc de Guiche plays a *rôle.*

Another Aeroplane.

ANOTHER aeroplane of the heavier-than-air type is said to be approaching completion ; it is the invention of an Italian aeronaut, Tito Landi. The new machine is of considerable power, having a 30-h.p. motor, and from experiments made with a model on the same principle, Signor Landi, like most other inventors, is absolutely confident of success.

RATING PETROL ENGINES BY CYLINDER DIMENSIONS.

By Dugald Clerk, M.Inst.C.E.*

The rating of an engine's power by means of cylinder dimensions is no new problem. It arose immediately upon the perfecting of the steam engine by James Watt, and it produced a series of more or less divergent rules, beginning about the end of the eighteenth century and terminating about twenty years ago. These rules were all intended to give the power of a steam engine directly from the cylinder dimensions. The power given by rule was long known as the nominal power of the engine, and steam engines used to be sold as so many horse-power nominal, capable of working up to some fabulous power, generally three times, and sometimes six times, the nominal power.

In "Bourne on the Steam Engine," in the 1872 edition, I find the rule given for nominal power of a low-pressure engine of James Watt construction: "Rule:—Multiply the square of the diameter of the cylinder in inches by the cube root of the stroke in feet, and divide the product by 47. The quotient is the nominal horse-power of the engine."

Bourne informs us that the assumed pressure in computing nominal power of the low-pressure engine is 7 lb. on the square inch, and that the piston speed varies with the length of the stroke from 160 ft. to 256 ft. per minute, 160 ft. a minute being common with a 2 ft. stroke, and 256 ft. a minute with an 8 ft. stroke. Two rules were given; one was in use for low-pressure engines and another for high-pressure. For the high-pressure rule, 21 lb. per square inch upon the piston was the accepted figure.

No doubt in the early days of the steam engine these rules gave close approximation to the actual power of the engine; but the progress of experience and invention so greatly changed the conditions that before the practically final disappearance of the term "nominal," the power of the engine, as I have said, was generally three times the nominal, and sometimes six. This conception of nominal horse-power was a great annoyance for many years to the engineering world. It introduced an artificial term which had no relationship with actuality; and matters were further confused when indicated horse-power and brake horse-power began to be used, as well as nominal horse-power.

I hope that in the case of the petrol motor, no rigid rules may be formulated, tending to impede progress, and prevent engine designers varying proportions and dimensions of their engines in any way which they may think best adapted to secure improved results.

Personally, I fear it is impossible to devise a rating rule which will enable one to accurately estimate the power of any engine from cylinder dimensions only. To obtain any such accurate rule would require uniformity of mean pressures, cylinder proportions, piston speeds, and engine revolutions, which would tend, in my view, to impede progress rather than assist it.

Before a rule can be framed at all, it is necessary to get accurate information as to the mean pressures produced, the piston speeds used, the total cylinder volumes used, and even the number of revolutions. If we could have standard mean pressures, standard cylinder proportions and piston speeds, then no doubt accuracy would be possible; but the accuracy of this year would assuredly be inaccuracy five years hence, and positive error in ten years.

In order to consider the matter with you I have had certain tests made—some by my partner, Mr. Adam, some by myself—by the Wolseley Company and by the Daimler Company. I am much indebted to the Wolseley Company for the care they have taken to prepare reliable tests for me from several of their Wolseley and Siddeley engines; and I have also to thank the Daimler Company for kindly giving me particulars of a test with one of their engines.

From these various tests I have prepared Table I., which gives results from ten petrol engines and one 3-cylinder gas engine. For the sake of completeness I have included in these particulars the results stated by Dr. Watson in his recent paper here. His engine, however, may be taken as experimental, as the piston speed is much lower than that usually adopted by makers for the market.

I have arranged mean pressure under two columns. In the one case the mean pressure given is the exact equivalent of the brake horse-power, without any allowance for friction; that is, it is that proportion of the mean pressure upon the piston which is really delivered from the engine in brake horse-power. The second mean pressure column gives the mean pressure upon the piston, assuming the mechanical efficiency of each engine to be ·8. The last column gives the piston speed. The power and cylinder dimension columns are self-explanatory. It will be observed that the cylinder dimensions in the petrol engines vary from 3½ ins. diameter by 4 ins. stroke as the minimum, to 7⅛ ins. diameter by 6 ins. stroke; and that the mean pressure equivalent to brake horse-power varies from 61 at the minimum to 81 as the maximum. The highest mean pressure actually exerted on the piston is 101·5 lb. per square inch, and the lowest 76·4. With pressures varying so much as this, it is obvious that no rule could be given depending on cylinder dimensions only, which would estimate, even with approximate accuracy, the power to be given by two engines. Two engines of exactly the same cylinder dimensions, with this variation in mean pressure, would vary as much as 25 per cent. in rated power. Judging, however, from these numbers, it appears to me that it would be very near the truth to say that a petrol engine of first-class construction should give a brake equivalent of about 70 lb. per square inch mean pressure upon the piston.

Table I.—Petrol Motor Tests.

Engine.	Cylinders.		B.H.P.	Revs. per min.	Mean pressure equal to B.H.P.	Mean pressure on piston M.E. ·80	Piston speed, ft. per min.
	Diameter.	Stroke.					
					lb. per sq. in.	lb. per sq. in.	
6-h.p. Wolseley	1 of 4·5 in.	5 in.	6·5 at	950	68·2	85·2	791·6
Dr. Watson's...	2 of 3·5 in.	4 in.	3·7 ,,	590	64·3	80·4	393·2
			4·4 ,,	700	—	—	466·8
12-h-p. Siddeley	2 of 4·5 in.	4·5 in.	12 ,,	1000	66·4	82·8	750
15-h.p. Siddeley	4 of 4 in.	4 in.	19·2 ,,	1200	63·0	78·8	800
25-h.p. Siddeley	4 of 4·5 in.	5 in.	35 ,,	1200	72·6	90·7	1000
			31 ,,	1200	64·2	80·2	1000
28–36-h.p. Daimler	4 of 4·32 in.	5·9 in.	35·6 ,,	1000	83·0	103·8	983·2
			32·0 ,,	1000	74·6	93·2	983·2
32-h.p. Siddeley	4 of 5·25 in.	5 in.	45 ,,	1200	68·5	85·6	1000
28-h.p. Humber	4 of 4·5 in.	5·75 in.	28·5 ,,	900	68·6	85·7	862·5
Siddeley Racer, 1904	4 of 7·125 in.	6 in.	85 ,,	1150	61·1	76·4	1150
Vertical "National" Gas Engine ...	3 of 9 in.	12 in.	75 ,,	450	57·6	M.E. ·85 67·8 lb. per sq. in.	900

Table II.—Air Standard Efficiency.

$\frac{1}{R}$	... ... E	$\frac{1}{4}$	... ... ·43	$\frac{1}{10}$	... ... ·61
$\frac{1}{2}$	... ... ·246	$\frac{1}{5}$	... ... ·48	$\frac{1}{20}$	... ... ·70
$\frac{1}{3}$	... ... ·36	$\frac{1}{7}$	... ... ·55	$\frac{1}{100}$	... ... ·85

Looking now at piston speeds, the engines from 6 h.p. to 15 h.p., excepting Dr. Watson's experimental engine, vary from 750 ft. to 800 ft. piston speed per minute. It might then be considered with some justice that the piston speed of a good engine varying from 6 h.p. to 15 h.p. could be taken at 800 ft. per minute.

The piston speed of the more powerful engines appears to vary more; from 28-h.p. Humber to 60-h.p. Mercedes it varies from 862·5 ft. to 1,350 ft. A piston speed, however, of a 1,000 ft. per minute appears to be very near the mark for all engines except racers.

From these tests I would suggest that for all petrol engines power might be calculated on the assumption of a brake equivalent of 70 lb. per square inch on the area of the cylinder, and for engines up to

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* A Paper read at the Automobile Club on March 22nd, 1906.

12 h.p. piston speed 800 ft. per minute, and over 12 h.p. 1,000 ft. piston speed per minute. A rule based on these assumptions would be of the form

$$\frac{D^2 \times N}{C},$$

where D is the diameter, N is number of cylinders, and C is a constant. The constant will be different for engines up to 12 h.p., and engines above 12 h.p.

It is true that such a formula is not really what one would call scientific, because it takes no note of the fact that higher piston speeds can be attained with longer than with short strokes. Mr. Remington, of the Wolseley Company, who has very kindly made the tests on the Wolseley and Siddeley engines here given for me, has proposed a formula at Birmingham, which is

$$\frac{D^2 . \sqrt[3]{S . N}}{C},$$

where D is diameter, S is stroke, N number of cylinders, and C a constant. This formula takes account of the fact that, from various causes, possible piston speed does increase with longer stroke. Curiously enough, this formula is exactly that given by Bourne in 1872 as used for low-pressure engines of Watt's type.

It would, it is true, be more satisfactory, and certainly more scientific, if one could suggest a formula which would include all the main factors determining power. Unfortunately, but little is as yet known as to some of these factors. Take, for example, the question of mean pressure. This depends—

(1) Upon ratio of compression in the cylinder ;
(2) Upon flame temperature of the mixture ;
(3) Upon temperature of the charge before compression ;
(4) Upon cooling surface and configuration of the cooling surface ; and
(5) Upon the time of exposure.

All these things vary in every engine. The effect of some of the factors is well known ; others are by no means understood. The law of the change of mean pressure with the compression is accurately known. The change is proportional to the change of efficiency, and this has been determined with some accuracy by a Committee of the Institution of Civil Engineers on the Thermodynamic Standard for Internal Combustion Motors. Although the change of mean pressure with increasing compression can be accurately calculated, yet this does not exhaust the matter. The question of pre-ignition comes in, and makes it in many cases impossible to predict what will occur in the absence of direct experiment.

The question of flame temperature also is pretty well understood, and it is known that too rich a mixture with too high a flame temperature tends to produce loss of economy and trouble in running. The question of charge weight is also understood, both from a mechanical point of view, requiring large and free inlet-valve areas, and from the physical point of view of heating the mixtures during entering. The exact effect, however, of surface and the shape of the surface is very little understood, although the time element can be accurately calculated. From this it will be seen that the question of mean pressure alone is a very complex one, so complex that experiment is the only safe guide.

With regard to the other important factor of power—that is, piston speed, broadly, the conditions arising with increased piston speeds are clearly understood. The limit comes from undue inertia strains. In many large gas engines the work of pulling up the piston at the end of each stroke produces pressures on the crank-pin almost as high as the explosion itself. It is difficult to predict any limit to piston speed with reasonable accuracy, because it depends so much upon weight of reciprocating parts, strength of material used, length of stroke, and so on. Altogether, it seems to me hopeless to expect to get any really accurate formula in our present state of knowledge. It is quite possible, however, to obtain more accurate information than we have at present. It will be noted, in looking at Table I., that mean pressures vary very much, but that 70 lb. per square inch on the piston, as brake equivalent, is not far out from the ordinary result.

The brake power at which many engines are rated seems to vary within wide limits, partly because I think many makers are content with a few minutes' run upon the brake at full load. I would suggest that all full load brake tests be made for at least five hours, with the water leaving the cylinders at a temperature of not less than 70 degs. Cent., and that the full brake load be given as the power to be got from the engine under these conditions. A few minutes' brake test is very misleading. I would suggest the same test for piston speed—that is, no piston speed be given which cannot be maintained for five hours at full load.

If such tests were made (under conditions which would ensure accuracy) of all the principal engines at present at work in Britain, we should soon be able to so increase our information as to determine easily the load which should be given by any good petrol engine of certain dimensions. This, I presume, is the real reason of requiring a rating rule.

It is interesting to note that in these engines the petrol consumption varies from ·1 to ·08 gallon per brake horse-power per hour, depending largely on the load. Generally, the best economy is got somewhat under full load—about three-quarters load.

For dealing with this subject at all, I wish to apologise to the makers of petrol engines, who must know very much more about the matter than I do, as I have had little time to make experiments away from my usual gas engine routine. For my presumption, however, you have to thank your genial and indefatigable secretary, Mr. Julian Orde. He would take no denial, although I assured him of two things :—(1) That I was very busy, and did not wish to write a paper ; and (2) that if I did write a paper, I feared it would not be in favour of petrol engine rating by any rigid formula.

THE KINGSLAND RADIATOR.

It is with the special precaution which has been taken to guard against leakage resulting from accidental damage to the face of the radiator, which constitutes the leading feature of this Kingsland radiator. An ordinary honeycomb radiator, in which the tube-ends are flush with the front plate, is liable, as all motorists who use them are aware, to spring a leak if something hard collides with it. In order to reduce this liability, Messrs. Bennett, Sons, and Shears, of Cecil Court, W.C., have constructed their radiator in such a way that the tube ends do not come near the face, but fit into a deep grid, so that they are, comparatively speaking, out of harm's way.

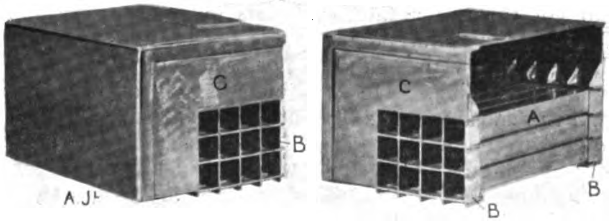


Fig. 1.—The Kingsland Radiator. Two views showing a small portion of the complete radiator and illustrating the internal construction.

This construction is very clearly shown in our illustrations, which represent a small portion of the complete radiator (Fig. 1), and a part of the grid separately, with a section composed of four tubes in their tube plates, in Fig. 2. The grid or tube plate, B, is ingeniously constructed so that it is virtually a solid piece, and the tubes, A, are sweated in place in the usual way. Owing to the depth of the grid, an ample surface is obtained to firmly secure the tubes, although they only project half through the plate, B, and in this way little damage is done to them should the outside edges of some of the cells become damaged.

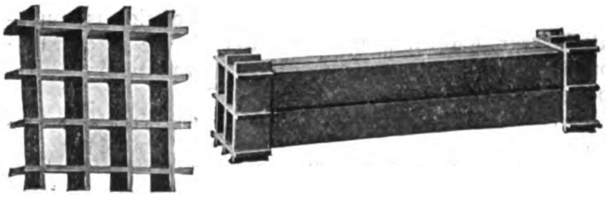
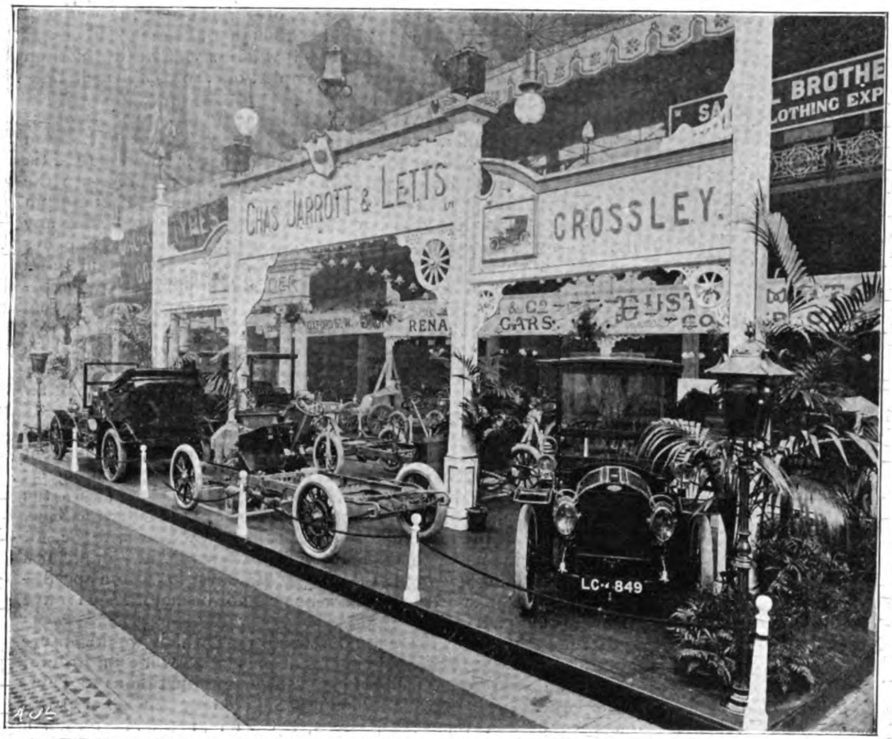


Fig. 2.—The Kingsland Radiator. Two views showing, on the left, a portion of one tube-plate separately, and, on the right, four of one tubes attached to the tube plates.



AGRICULTURAL HALL MOTOR SHOW.—The Stand where the Crossley Cars are staged by Messrs. Charles Jarrott and Letts, Limited.

Fact or Translated Fiction?

THERE has been more than one miscreant who has used the motor car to assist in illegal annexation of other people's property. Now regular highway robbery by motor car is announced from Nanterre, near Paris, where a M. Desbrousses was returning home towards eleven o'clock, after having dined with a friend in the neighbouring township of Rueil. Two men were standing near an automobile, and asked M. Desbrousses for a light. As he was searching for his match-box they bowled him over, held him while he was struggling on the ground, rifled his pockets, and relieved him of nearly £200 in notes. They then sprang upon their car, and disappeared in the darkness. The identity of the auto-highwaymen has not been discovered. We wonder whether the entertaining story, which first appeared in our well-known contemporary, *The Car*, entitled "The Motor Pirate," has been translated into French?

Motor 'Bus Drivers' Appeal.

THE decision of Mr. Plowden, by which two motor 'bus drivers were fined £5 each and costs for alleged racing along the Marylebone Road, is to be appealed from, as the result of counsel's opinion, which has been taken by the London 'Bus, Tram, and Motor Workers' Union.

A Dream of Speed.

IT is quite refreshing to find that not all the Inventors (with a big I) are occupied with flying machines. There is another gentleman who has appeared upon the scene with a new invention in the motor boat line, which he claims will go at a speed of 100 miles an hour through the water (there or thereabouts), and he is confident it will cross the Atlantic, if floated (we mean financially), in two days. Needless to say, the main particulars of this epoch-making invention are kept a profound secret; but the following revelation is vouchsafed. Mr. Ridley, who is declared to be responsible for the new invention, according to the reporter, has spoken as follows:—

> "I use water for the propelling power. There is a 4½-in. pipe running from the bow of the boat to the stern. As the boat goes along, the water comes through the tube to the centre of the boat, where I have a kerosene motor of 10-h.p.
>
> "Here I generate gas by a secret system, and this gas enters the cylinder. The water going through the tube forms a piston in the cylinder, and at each explosion of gas is driven down and out through the rear of the tube against the main body of water.
>
> "Thus, the faster the boat goes, the faster the water comes through, and the more speed is supplied.
>
> "No greater power can be obtained than by this method."

This is reminiscent of Mr. Cutliffe Hyne's prehistorical novel about Atlantis, in which the wonderful vessels of that legendary island were propelled on somewhat similar principles. Perhaps Mr. Ridley had been reading this story before he fell asleep.

Vulcanizer as Infernal Machine.

WE do not know whether Messrs. Harvey Frost and Co., who supply the "H.F." Car Vulcanizer, have any friends amongst the Russian police. They ought, at any rate, to entertain the friendliest of feelings towards that sometimes not highly appreciated body for procuring for them a free advertisement in nearly every important newspaper in Europe. An English motorist recently betook himself and his car to Russia, with a view, presumably, of making a tour through that Empire. His baggage contained an "H.F." vulcanizer for use should he be troubled by punctures on the road. The Customs officials who examined his baggage found the appliance among it, but, with the artfulness which characterises the Russian official, said nothing about it, and away went the happy motorist to his hostel, fondly fancying that he had got through admirably. His joy was premature. Two detectives turned up at his hostel, and promptly charged him with being in possession of a bomb or infernal machine. He explained as well as he could what the vulcanizer was for, but the officials triumphantly pointed to the pressure gauge, which is used to determine the temperature of the steam which heats the vulcanizer, maintaining that this was evidently the clockwork device by which the infernal machine was to be exploded. The unhappy motorist was thrust into gaol, where he remained for three days whilst the police were communicating with London in order to ascertain whether their victim's statement were correct, and whether the vulcanizer was a bomb or the harmless machine its owner maintained it to be. Finally he was set at liberty, but we have not heard, and do not think it likely, that he has received any compensation or even an apology. The episode forms an instructive comment on the level of education and intelligence among the Russian "guardians of law and order!" Russia is certainly not the place for touring motorists.

Motor 'Bus Troubles Looming Ahead.

We regret to find that a motor omnibus strike has broken out among the employees of the London and Suburban Motor Omnibus Company, with the symptoms of its spreading, a state of affairs that with the present satisfactory economic condition of the movement one would not have anticipated. Until quite recently the drivers have been paid 10*s.* and the conductors 6*s.* per day. A change was established by the manager and tried by the drivers, by which they received 8½*d.* and 5½*d.*, respectively, per journey. They worked it for a week, and presumably found that it resulted in such a tremendous reduction that they have all gone on strike.

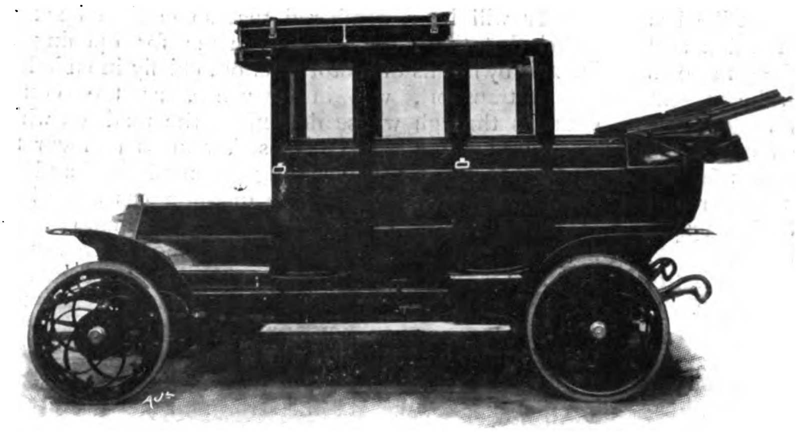
What is a British Vehicle?

A legal point of considerable interest, and one on which lawyers would probably argue through a whole legal term, has been raised by the British Empire Motor Trades Alliance in correspondence with the Board of Trade, as to how far a car built in this country but containing, say, an engine or other parts built abroad, should, under the Merchandise Marks Act, be labelled as manufactured abroad. The Board of Trade in its reply on the question is very carefully non-committal, and no one can make out from their statements what their view or opinion happens to be, their position in fact being that "the question whether a false trade description has been applied to goods in any particular case must depend upon the special circumstances in that case, and can only be determined definitely by a Court of Law"—so that, as a matter of fact, we are no further forward than we were.

The Iveagh-Pirrie Scheme.

It will be remembered that some time back we stated that the Iveagh-Pirrie scheme for opening up Ireland by means of motor traction, chiefly intended for goods transport, was in abeyance, as the county councils through whose dominions the roads on which it was proposed to run it, passed, refused to incur the expense necessary for enabling the roads to stand the extra traffic anticipated. The question has again been discussed recently in the House of Commons. It appears from the remarks of the Chief Secretary for Ireland that a year was allowed to the county councils to reconsider their decision in this matter, and that as that period had passed without any alteration of the attitude these bodies had assumed, the scheme will be definitely abandoned. This is, of course, a misfortune, but how far the whole blame is to be thrown on the Irish county councils it would not be easy, without exceptional local knowledge, to say. The requirements made upon them would doubtless have entailed a heavy expense to their ratepayers, and we do not gather that the promoters of the scheme suggested assisting the county councils by assigning them any proportion of prospective profits (to diminish the prospective increase of rates) or in any other way. Taking them all round, Irish roads are no worse than English roads, and in some districts they are a great deal better, so that there may be some grounds for the view that either the promoters of the scheme selected districts troubled with peculiarly bad roads, or else that they intended putting an unusually destructive system (as compared with other automobile services) of traffic upon them.

MOTOR CARS AT THE PYRAMIDS.—The appearance of the automobile in front of the time-hoary monuments of ancient Egypt is highly suggestive of many things, and forcibly recalls Napoleon's observation to his troops on the same ground:—"Des hauts de ces Pyramids quarante siècles vous regardent."



A double brougham "Brooke" Car, just constructed for the Hon. A. E. Guinness.—The chassis is a standard 35-h.p. with 10-feet wheel-base. De Cadignan spring wheels are fitted to all four wheels, and in addition to the two acetylene head lamps, an electric generative set provides for the two side and tail lamps.

The New "Austin" Engines.

A NOVEL arrangement has been adopted by Mr. Herbert Austin on his new engines for preventing any distortion of the cylinder-castings after the engine has been started, and while the temperature is attaining the normal. Instead of casting the cylinders in one piece complete with their jackets, he leaves the lower ends of the jackets open until after the castings have been machined. A cast-iron ring is then screwed into place between the jacket and the cylinder-wall, a "Dermatine" washer making a water-tight expansion joint between it and the cylinder.

More Motor-Arctics.

THE way in which the automobile appears to have seized upon the minds of intending Arctic explorers is becoming quite a noteworthy feature of the present day. We have had various proposals to "dash upon" the South Pole by motor car, none of which, by the way, has as yet even taken the first steps, and now we have a proposed expedition by Herr Mylius Erichsen to cross the central plateau of Greenland (where the great dome of ice is believed to rise some 10,000 feet above the sea level, forming probably the coldest spot, at any rate, in the northern hemisphere) by motor car. This is a more inaccessible part of the ice continent than that which was crossed by Dr. Nansen, and how motor cars will acquit themselves there will certainly be an interesting, not to say exciting, problem, at any rate, for those engaged in the expedition. It is not Herr Erichsen's intention, however, to set forth before March, 1908, and by that time the automobile will quite possibly have undergone a considerable amount of modification and development, or mayhap he will find an airship more suitable for the adventure.

Herr Jellineck Mercedes Honoured.

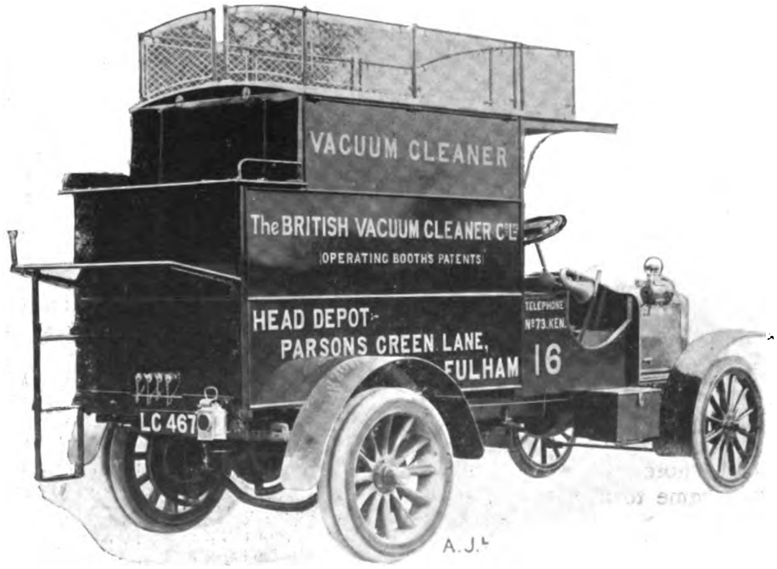
THE distinction of a Chevalier of the Legion of Honour has been bestowed upon Herr Jellineck, at the instance of the French Minister of Commerce.

Ex Oriente Lux

WE do not know exactly how the wise men of old journeyed from the East. But the latest wise men who have come westward to visit England *and* the office of the *Daily Express* arrived at the latter centre of interest last week in a White steam car. They were arrayed in the national costume of Persia, and their adoption of this most Western form of locomotion once again gives the lie to the silly adage that "West is west and East is east, &c."

Cave Canem.

MANY English automobilists who have wrenched their wheels or deranged their steering gear in a desperate effort to avoid "the friend of man" when diving across in front of them, as is his delight, and those even more unfortunate ones who, after having their cars put seriously out of order through being mingled with the mangled anatomy of a dog, will feel disposed to erect in the privacy of their homes a secret shrine to the magistrate of Lorgues (in France). On a recent occasion a motor cyclist, who had been unfortunate enough to run over and kill a dog, was arraigned before this Gallic Solomon, who delivered the following judgment on the situation:—"Citizens," said he, "have an indisputable right to let their dogs run on the roads, *but it is at their own risk*, for dogs are animals of *extreme mobility*, and their presence is a serious danger to traffic."



A motor driven vacuum cleaning plant. This is the second vehicle Messrs. Thornycroft have supplied to the British Vacuum Cleaner Company. The pump is driven by the four-cylinder engine and will exhaust the air sufficiently rapidly to enable the four pipes—which are attached to the nozzles seen at the rear of the van—to be used simultaneously.

Sir Ralph Gore's 6-Cylinder Mercedes Racer.

REFERRING to the illustrated description that we gave last week of the new 6-cylinder Mercedes engines, Mr. J. E. Hutton tells us that he has already sold the first racing car of this new type to Sir Ralph Gore, Bart., this high-powered car being the fourth which Sir Ralph has purchased from Messrs. J. E. Hutton, Ltd. During the last two years Sir Ralph Gore will have had one 60-h.p. and two 90-h.p. Mercedes racers, in addition to this 6-cylinder 150-h.p. model.

Mr. Glidden in Ceylon.

MR. GLIDDEN, who is continuing his tour on his Napier car through the Far East, has now "done" Ceylon, having covered, as we mentioned last week, no less than 1,334 miles in that island, his tour including the most northerly point, Point Pedro, and the most southerly point, Dondra Head. Mr. Glidden is enthusiastic in regard to Ceylon as a country for motoring in. His description of the scenery is that it varies from "fine" to "superb," and from "superb" back again to "fine." It is nowhere, except perhaps for stretches of jungle, "indifferent," and the roads vary from "good" to "excellent," being only in two cases merely "fair." In fact, Mr. Glidden prefers the island even to Java, which he formerly, if we recollect rightly, described as "the motorists' paradise," the climatic conditions being more favourable. Mr. Glidden has now left Ceylon for Saigon, where, it will be remembered, the Russian Fleet made a long sojourn on their way to Tsushima, and thence proceeds to Bankok and Japan.

Foundlingism.

THE automobile has been employed for nearly every conceivable purpose. It has figured in the Divorce Court; we have had a number of elopements by motor car; we have had motor car smugglers and burglaries from the car; a motor pirate has recently appeared in Paris; and now we have encountered an instance (in Germany) of what we must coin a word to describe, and term "foundlingism." At the town of Eupen, in the Lower Rhine district, it is reported, a gentleman in a motor car drove up to the principal hotel, went in with a basket to obtain a glass of beer, swallowed it hurriedly and re-mounted the car. As he was starting the presence of the basket in the hotel was observed, and the landlord rushed out, shouting to inform the driver of his oversight. The "oversight," however, was apparently an intentional one, for the basket when opened was found to contain a baby, which, of course, at once began to cry. When the baby was undressed and put to bed, £400 in notes were found pinned in her garments, with an unsigned letter promising £400 more in two years' time. This windfall came to a good-natured gamekeeper, who said that as he had nine children already a tenth would make little difference, and had taken the foundling home with him. The "perpetrator of the outrage" has not been discovered, as he apparently obscured his number while passing through the town where he had deposited the infant.

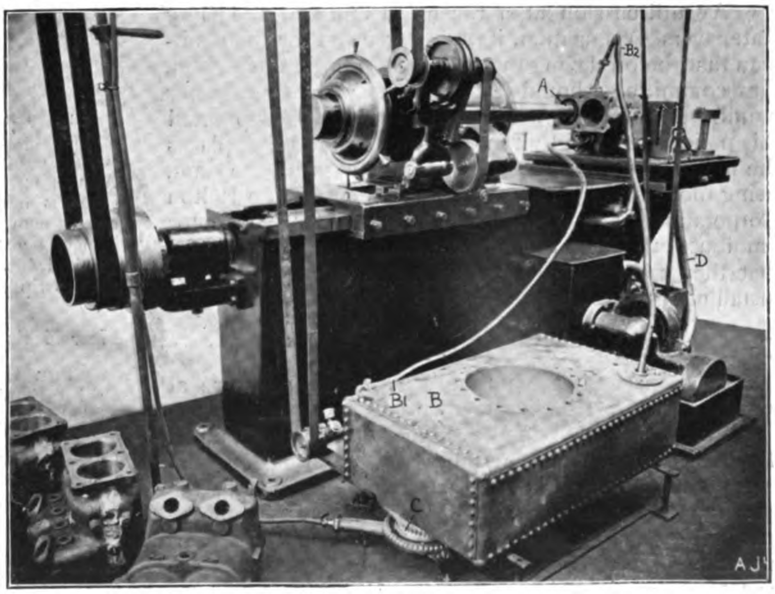
An Equine Pace-Maker.

IN a recent case heard before Mr. Justice Lawrance, in which damages were claimed by an auctioneer of Isleworth from a motorist for running into his horse and cart, the plaintiff stated that at the time of the accident his cob was trotting along at the rate of from *two* to *three* miles an hour. Mr. Justice Lawrance promptly observed that the plaintiff ought to make a point of sending such an animal to a horse show, and the jury, who evidently formed their own views of the value of the steed who trotted at this pace, assessed the damages at only £5.

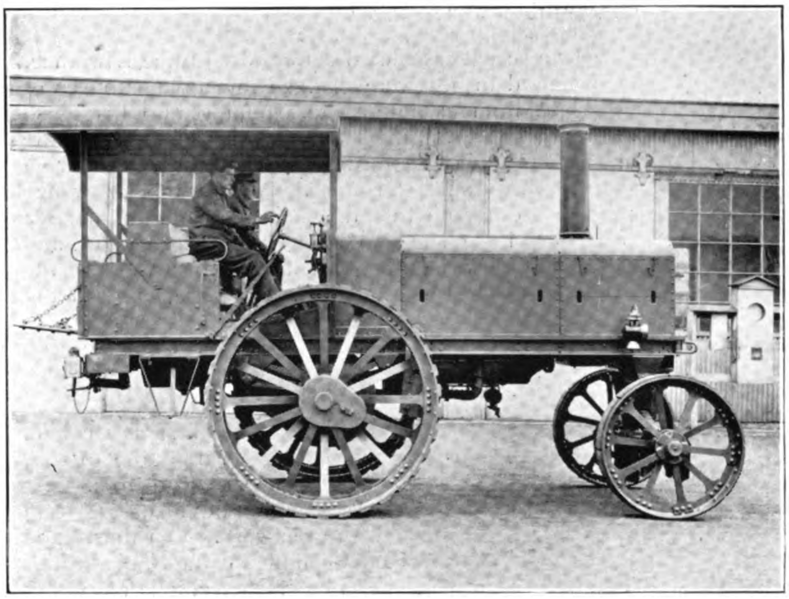
Grinding a Cylinder.

MOST motorists are aware that the first-class cars of to-day have most of their parts ground true to size, instead of being merely finished with a cutting tool. Not only is the process far more accurate, but no other system gives such a smooth finish to the work. Our illustration represents this process on a cylinder at the Napier works. The novel feature is, in this case, that a circulation of hot water is kept up through the jackets in order that the conditions under which the grinding is performed may be as nearly as possible identical with the conditions under which the engine will work subsequently.

The "Corundum" grinding wheel, A, is seen partly inside the cylinder which it is grinding up. It is mounted eccentrically, so that whilst revolving at a high rate of speed, the spindle also slowly travels round, as well as moving inward in order to bring the revolving wheel equally in contact with the whole surface. In the foreground the water-tank, B, with its feed and return-pipes, B^1 and B^2, is visible. Beneath the tank is the gas-burner, C, which keeps the water boiling. Behind the cylinder is an air-pipe, D, through which a fan draws out the powdered iron. Emery wheels are not used for this work, because of the danger of embedding particles in the metal. "Corundum" is a patent composition of a similar character, and is used at a peripheral speed of 3,700 feet per minute.



The grinding machine which is used for finishing off the cylinders of the Napier engines. It will be noticed that a hot water circulation is maintained through the jackets during the process.



Two "heavy-oil" tractors have recently been supplied to the War Office by Messrs. J. I. Thornycroft and Co., the larger of which is shown in the above illustration. It has a 4-cylinder engine of 40-h.p., with cylinders of 6-in. bore by 8-in stroke, while the smaller tractor is practically similar to the 2-cylinder 25-h.p. model of which we gave a fully illustrated description on April 8th and 15th last. Both machines have satisfactorily undergone official tests lately, the 40-h.p. model having been subjected to a brake trial of the engine, a road trial pulling a gross load of 14 tons up an incline of 1 in 12, and a test on soft ground, hauling a 7-ton load forwards and backwards as well as pulling the load out with its winding gear; the 25-h.p. tractor, which is equipped for search-light work, underwent a 6-hour trial driving its dynamo at full load, and a 200-mile road run under official supervision.

Wedding Bells.

LAST week Miss Maud Julia Salomons, eldest daughter of Sir David Salomons, Bart., was married to Captain J. H. Blunt, eldest son of Sir John Harvey Blunt, Bart., of Tunbridge Wells.

Progressive Municipalities.

AT a discussion at a recent meeting of the Bury Ratepayers' Association, it was suggested by the chairman that, before laying the proposed tramline to Bolton, the committee should experiment with two motor omnibuses. Another speaker, Mr. Bridge, who supported this policy, declared that in Manchester and other places the motor 'bus was successfully competing with the tram, being more speedy and more convenient. The Bolton Corporation, it was pointed out, having tried motor omnibuses to Darcy Lever, had found them so successful that they had decided to continue their use instead of installing a tram systsm.

Conversion of Fire Engines.

IT seems as if the automobile fire engine were at length destined to obtain adequate recognition from the Fire Committee of the London County Council. Though only a small number of self-propelled fire engines have been as yet adopted by the Council, the question of converting existing horse-drawn "steamers" into self-propelled fire engines is engaging the serious attention of the Committee. It is estimated that the cost of conversion will be £575 per machine, and even at that not inconsiderable figure, we gather a large number of machines will be converted.

Municipal Trading again Bars the Way.

THE Southend Town Council has refused to grant a licence to the Southend Motor 'Bus Company for running motor 'buses for hire through the town, the Council being the owner of a tram undertaking.

Dundee Following the General Example.

THE municipal authorities of Dundee are considering the advisability of applying for powers to enable them to run a motor omnibus service in preference to the more costly alternative of adopting the electric tram.

A "White" Day in the Park.

THE extent to which artists of note who, when they at one time touched upon the subject of motor cars at all, usually perpetrated some awful solecism or produced some structural monstrosity of an impossible kind, have learned to accurately observe and reproduce cars as they are, is shown by the fine drawing by the well-known artist, Mr. Arthur Garratt, which appears in the current number of our illustrated weekly contemporary, the *Sphere*. Mr. Garratt, in accordance with the title he has selected, shows a day of snow in the park and two of the latest types of White steam cars meeting at a corner, where the snow lies deep. Both the "Whites" are reproduced with a degree of accuracy sufficient to entitle them to a place on our weekly page of "Cars and How to Recognise Them." Incidentally, attention is drawn to the special capabilities of the "White" in negotiating snow-covered roads.

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COMMERCIAL POINTS.

THE manufacture of omnibuses of the most up-to-date and approved pattern is extensively engaging the attention of the New Arrol-Johnston Car Company, Limited, of Paisley, Scotland. Although placed on the market only a few months ago, the 24–30-h.p. omnibus built by this company has already been the means of quite a number of orders reaching the makers. In this connection it may be stated that the Cambridge Motor Omnibus Company, Limited, has been promised the early delivery of several vehicles of the description in question.

New Zealand International Exhibition.

THE High Commissioner of New Zealand has advised the British Empire Motor Trades Alliance that his Government has cabled him as follows:—

"A great number of intending purchasers of motor cars in the Colony are awaiting the display at the New Zealand International Exhibition, believing that up-to-date specimens will be shown there. Please call the attention of manufacturers in England and on the Continent to prospects of business."

This Exhibition will be held under the auspices of the New Zealand Government at Christchurch, commencing in November next. The British Government have intimated their intention of occupying a large space in the British Court with a comprehensive display of education, art, social economy and physical culture of the United Kingdom; and the New Zealand Government, being desirous that the British Court should be as important as possible, have decided that all the manufactures and products of the United Kingdom should be exhibited therein, and that applications for space in it should be made at the office of the Commissioner, 13, Victoria Street, S.W. The charge for space is 2s. per square foot, and we understand that the best positions are already being rapidly taken up.

THE Car and General Insurance Corporation, Ltd., have just issued a new motor car prospectus. For private motor cars, amongst other points to which the Company call special attention are the following, namely:—

(1) Any licensed and competent driver is covered in addition to assured and paid driver.
(2) Lamps, which have always been excluded, are now covered without extra premium.
(3) The first 20s. in the case of accidental damage is only excluded if repairs do not exceed £5 instead of £10 as hitherto.
(4) The fire protection now includes a definite amount for accessories.
(5) Copy of the policy is printed on one side of the prospectus.

Ariel Cars.

A LIMITED number of 15 and 18-h.p. 4-cylinder Ariels having been acquired by the Ariel Motor Company as part payment for their larger 25-30.h.p. vehicles, they are now offering these at reduced prices, after having overhauled them at their works. Those who are on the look-out, therefore, for a secondhand car in reliable condition, will do well to take the opportunity of communicating with the Ariel Motor Company, at Selly Oak, Birmingham.

Badges on Motor Cars.

IT is becoming more and more popular at the present day for manufacturers to decorate their cars with some emblematic sign, which usually takes the form of a neat enamelled badge on the radiator. One of the first of these was the Trèfle-à-Quatre, or four-leafed clover of the Richard-Brasier Co., but there are now quite a number, among the better-known being the Lorraine Cross on the De Dietrich cars, and the Coronet and Monogram on the Clement-Talbot vehicles. We understand from Mr. Simms that he has adopted "the heraldic rose (executed in pink enamel or silver)" for the Simms-Welbeck cars, and that all the new models will be adorned with this badge on the radiator.

SECOND-HAND cars made by leading makers are booming just now at much better prices than a year ago. By way of example, it was possible to procure a 1904 model 6-h.p. De Dion (seating two), second-hand, in good condition for about £100. Now £130 is asked and given.

THE Fiat motor omnibus, which recently did so well on its trial trip, was, we are advised, fitted with "Royal Sirdar-Buffer tyres." The solid-tyred Wolseley, Argyll, and Albion cars at the Glasgow Exhibition were fitted with Royal Sirdar-Buffer tyres.

AT the recent Glasgow Exhibition, we are informed, 32½ per cent. of all tyres fitted to wheels were Continentals.

AMONG well-known men ordering Crossley cars last week through Messrs. Charles Jarrott and Letts are the Baron Bruno Schroder, Mr. C. H. Whittington, of the London Stock Exchange (40-h.p. cars), and Sir William Gull, Bart. (a 22-28-h.p. model). The carriage bodies are all being built by Messrs. Hooper, the Baron Bruno Schroder having a large limousine capable of carrying six persons, fitted up with electric light and armchair seats. Mr. Whittington's order is for a large three-quarter limousine with detachable top. In addition to these orders, Mr. A. C. Swinton, Chairman of the Arrow Omnibus Company, also placed his order for a 22-28-h.p. Crossley.

OWING to the continued rise in the price of material, the Rover Company, Limited, advise us that they find it necessary to advance the price of their £105 and £120 6-h.p. cars. The respective prices after 31st March will be £110 and £125.

THE Coventry Chain Company desire to ask the indulgence of their clients if their deliveries of motor chains should not be quite as prompt as they would like them to be, as although they have increased their output in this direction, they still find they keep somewhat behindhand with their orders. In addition to the large order which we announced from the Daimler Motor Company, we learn that that Company have now passed them a further order of 25,000 feet.

The Coventry Chain Company are, we understand, making further arrangements by which they hope to shortly overcome all delays.

PUBLICATIONS RECEIVED.

Catalogues.

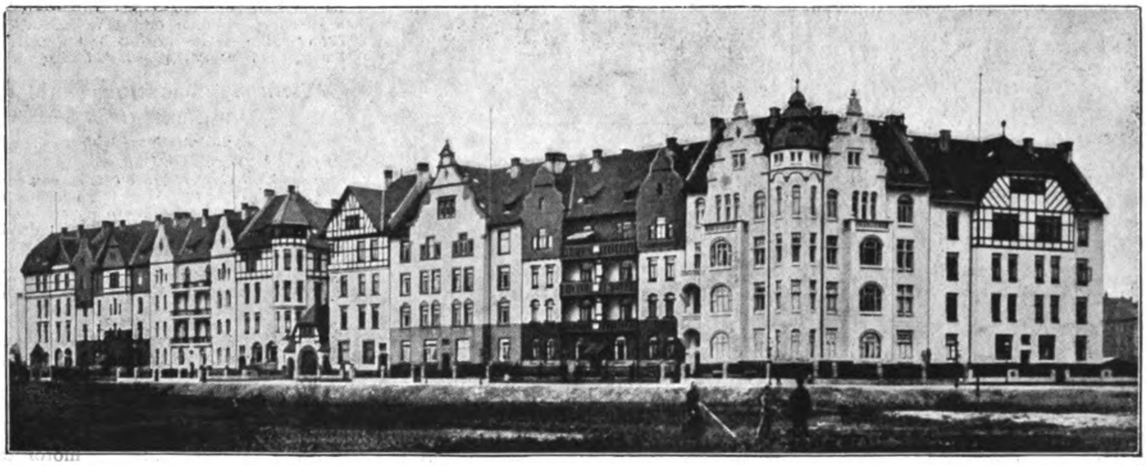
Motor and Cycle Accessories, 1906. The Rotax Motor and Cycle Co., 43-45, Great Eastern Street, E.C.

Royal Enfield Autocars. The Enfield Autocar Co., Ltd., Redditch.

Clincher Motor Tyres, 1906. The North British Rubber Co., Ltd., Castle Mills, Edinburgh.

"*There is Nothing like Connolly's Leather.*" Connolly Brothers, King's Cross, N.

Thornycroft Commercial Motor Vehicles. John I. Thornycroft and Co., Ltd., Chiswick.



It may be of interest to the many customers of the Continental Tyre and Rubber Company, who are now doing a large and increasing business, to learn that the Company in their German works near Hanover have carried into practice the principle of looking after the welfare of their workmen to a high degree of development. No less than 83 workmen's dwellings have been erected by the Company, in which the workmen live, in flats, the rent varying from £10 to £21 per flat per annum. In connection with this extensive system of buildings, a library for the use of their employees is provided, and a large playground of some 720 square yards is set apart for the use of their children, while a benefit fund, out of which as much as £600 has been paid during the last five years, is also maintained for the advantage of the workpeople. The elaborate scale and artistic character of these workmen's dwellings can be appreciated from the above photograph, which the Company have forwarded to us.

NEW COMPANIES REGISTERED.

Belsize London Agency (Limited),—Capital, £11,000 (10,000 £1 ordinary and 20,000 1s. deferred). Object, to acquire the rights of J. E. H. Monypenny under an agreement between himself and the Belsize Motor Car and Engineering Company, Limited, and with the said J. E. H. Monypenny, and to carry on the business of agents for and dealers in motors, &c. First directors, F. Loeser, R. A. Unthank, and J. E. H. Monypenny.

The Dundee Cycle and Motor Company (Limited).—Capital, £1,500 in £1 shares.

Great Eastern London Motor Omnibus Company (Limited), 17, Cockspur Street, W.—Capital, £405,000 (400,000 ordinary of £1 and 100,000 deferred of 1s.). First directors, F. Griffiths, Sir Thomas D. Pile, T. Skinner, Sir George W. Truscott, and A. Willis.

Great Eastern Motor Trust (Limited).—Capital, £1,000 (£1).

London and Provincial Motor Omnibus Company (Limited).—Capital, £100 (£1).

Motor Delivery Company (Limited), 1, Belfast Chambers, Beak Street, W.—Capital, £5,000 (£1). First directors, G. H. H. Freeman, H. J. D. Clerk, and Mrs. K. B. White.

Motor Enterprises (Limited).—Capital, £3,050 (3,000 £1 ordinary and 1,000 1s. deferred). First directors, Hon. G. E. H. Trevor, J. A. McCandlish, H. W. Dawson, S. K. Albright, and A. Rawlinson.

Motor Trading and Contract Corporation (Limited).—Capital, £20,000 (£1).

Rolls-Royce (Limited).—Capital, £60,000 (£1). Object, to acquire from Messrs. Royce, Limited, their factory at Cooke Street, Hulme, Manchester, together with the business of motor car and motor chassis manufacturers. First directors : F. H. Royce (managing), E. A. Claremont, the Hon. C. S. Rolls, and C. Johnson.

Rolls-Royce Distributing (Limited), 14 and 15, Conduit Street, W.—Capital, £10,000 (£1). Object, to acquire, sell, hire, let on hire, and deal in motor cars, &c. First director : Hon. C. S. Rolls.

Safety Motor Screen Company (Limited).—Capital, £1,000 (£1). First directors: J. C. Wood (governing director), and J. C. Crowdy.

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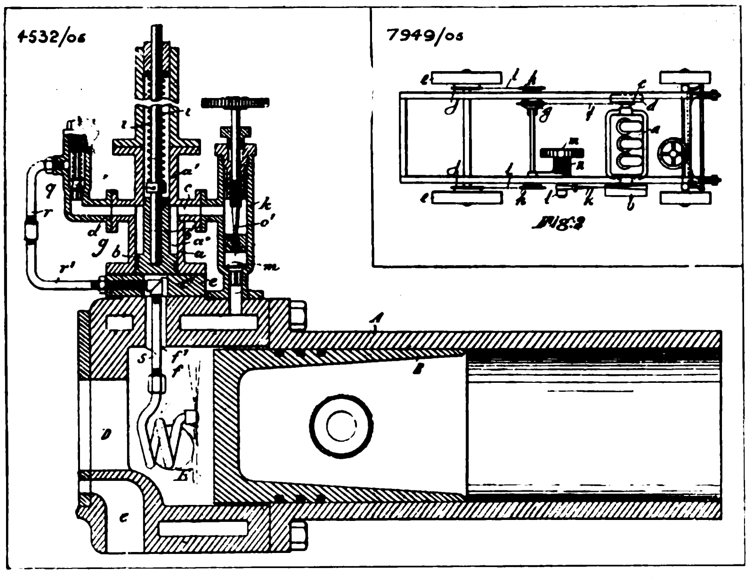
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application ; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

4532. 4th March, 1905. Improvements in or relating to Internal Combustion Engines. Edward Field and Francis S. Morris, 4, Trafalgar Square, London. This invention relates to internal combustion engines of the kind designed to be worked with motive fluid, comprising gases in combustion and water vapour or steam, and it relates to means or apparatus whereby the pressure set up in the combustion-chamber of an internal combustion engine by the explosion of combustible charges can be utilised to force water into such chamber, so that the admission of water will be effected only when an explosion takes place. There is one drawing A is the cylinder of an internal combustion engine, provided with a piston, B, and having an inlet, C, for air, an inlet, D, for air and combustible gas, and an outlet, E, for exhaust products, these parts being of ordinary construction. The apparatus for supplying water to the combustion-chamber comprises a vertical pump cylinder, *a*, formed with a tubular extension, a^1, of smaller diameter, and fitted with a plunger made of two diameters, *b*, b^1, the larger portion, *b*, constituting a piston fitting the pump-cylinder, *a*, and the smaller portion, b^1, fitting the tubular extension, a^1, so that when the plunger is in its normal or lowest position an annular water space, a^*, will be left between its smaller portion, b^1, and the cylinder wall. The lower end of the cylinder, *a*, and the upper end of the extension, a^1, are open, while the upper end of the cylinder, *a*, is provided with water inlet and outlet passages, *c*, *d*, respectively. The lower open end of the pump cylinder is secured as through a perforated block, *e*, over a hole, f^1, in the wall of the combustion-chamber, *f*, of an internal combustion engine, the hole, e^1, in the block, *e*, being in line with the cylinder, so as to leave *a* round the hole, e^1, at the outer end thereof an annular seat upon which the larger end, *b*, of the pump-plunger normally bears. When the pressure in the engine-cylinder falls sufficiently on the working or exhaust-stroke, the pump-plunger will be caused by its spring, *i*, to descend, and permit water to flow into the annular cylindrical space, a^*, above the pump-piston, *b*, past the suction and regulating valves, m–o^1, the rate of supply of water being capable of adjustment, to suit working requirements, by adjusting the regulating-valve, o^1, and when the next combustible charge is exploded, in the combustion-chamber, *f*, the resulting pressure of the gases, acting on the bottom of the piston, *b*, will cause the latter to rise and force the water from the cylinder, *a*, past the delivery-valve, *q*, and through the water delivery pipes, *r*, r^1, *s*, into the combustion-chamber, *f*, of the engine, where it will be caused to intermingle with the hot gases.—March 7th, 1906.

7949. 14th April, 1905. Improvements in Mechanically-propelled Road Vehicles. Frederick W. Lanchester, 53, Hagley Road, Edgbaston, Birmingham. This invention relates to improvements in mechanically-propelled road vehicles, and refers more particularly to improvements in the propelling mechanism and the arrangement of same for the vehicles. In power-propelled road vehicles, as hitherto constructed, the fly-wheel gives steadiness of running between certain limits, but it is insufficient to act as an effective reservoir of energy available for hill-climbing. Cars travelling at high speeds are capable of surmounting considerable obstacles, such as hills of some sixty to eighty feet magnitude, by their own energy of motion, and this is assisted but little by the fly-wheels as usually employed. The provision of an effective store of fly-wheel energy to surmount hills of some hundreds of feet in height could, on cars as ordinarily constructed, only be made by the use of fly-wheels of great weight and diameter, involving serious difficulties. These difficulties have heretofore been overcome by a high-velocity fly-wheel, or what is termed a "spinner." The spinner is made from a forging of tough nickel steel or other metal (having a very high elastic limit) of a disc form. There are two figures. Fig. 2 is a plan illustrating the application of a spinner to a motor road vehicle. *a* is the engine or motor, *b* a belt pulley on one end of the motor shaft, *c* a chain-wheel with clutch, *d*, on the opposite end of the shaft. The power is transmitted to the driving road wheels, *e*, of the vehicle through the chain, *f*, balance gear, *g*, chain wheels, *h*, chains, *i*, and chain wheels, *j*. By means of the belt, *k*, between the pulley, *b*, and the fast and loose pulleys, *l*, the spinner, *m*, on the arbor or spindle, *n*, can be placed in or out of driving connection with the motor, *a*, any suitable belt-shifting device being arranged to move the belt from the fast to the loose pulley and *vice versa*. Thus the spinner may be driven from the motor or allowed to run free or independently in order to minimise friction, and so conserve as long as possible its store of energy. When it is disconnected and allowed to run freely, after a period of running under the power of the motor, the spinner will retain for a considerable time sufficient velocity to enable it to start the motor from rest or run the car for some distance without assistance from the motor. When the spinner and the motor are connected and running together, the car can be readily carried or driven over obstacles or up gradients such as could not be surmounted with an ordinarily constructed and arranged fly-wheel other than by the employment of an engine of abnormal power.—March 7th, 1906.



Patent Specifications Published.

Applied for in 1905.

Published March 29th, 1906.

2,517. T. Gare. Resilient wheels.
4,361. H. Livesey. Intl. combn. engines.
4,517A. W. G Hay. Mechanism for transforming reciprocating into rotary motion.
8,117. J. S. Fairfax Change-speed driving-gear.
11,211. C. Houben. Cylinders of intl. combn. engines.
11,220. L. G. Sabathé. Intl. combn. engine.
11,917. Birmingham Small Arms Co., Ltd., and C. F. Fougher. Variable speed gear.
13 444. J. B. Le Maitre. Tyres.
13,559. O. Rothe. Brake to prevent side-slip.
14 076. G. Pilkington. Spring forks for motor bicycles.
14,163. J. S Napier Brakes.
14,639. O. Klepal and A. Traub. Valves.
15,652. F. Karmeli. Silencers.
15,880. A. E. Lamkin. Sparking plug.
20,383. O. Werner. Seat suspension
22,833. L Krieger and Cie. Automobile vehicles.
23,103. A. J. Betteridge. Brakes for motor cycles.
23,347. A Rivett. Wind and dust shields.
24,743. P. Albertini. Reversing gear.

Applied for in 1906.

Published March 29th, 1906

342. S. J. Watson and G. H. Smith Tremblers of induction coils.
691. F. F. Wellington and Brit. Automobile Commercial Synd., Ltd. Seats.

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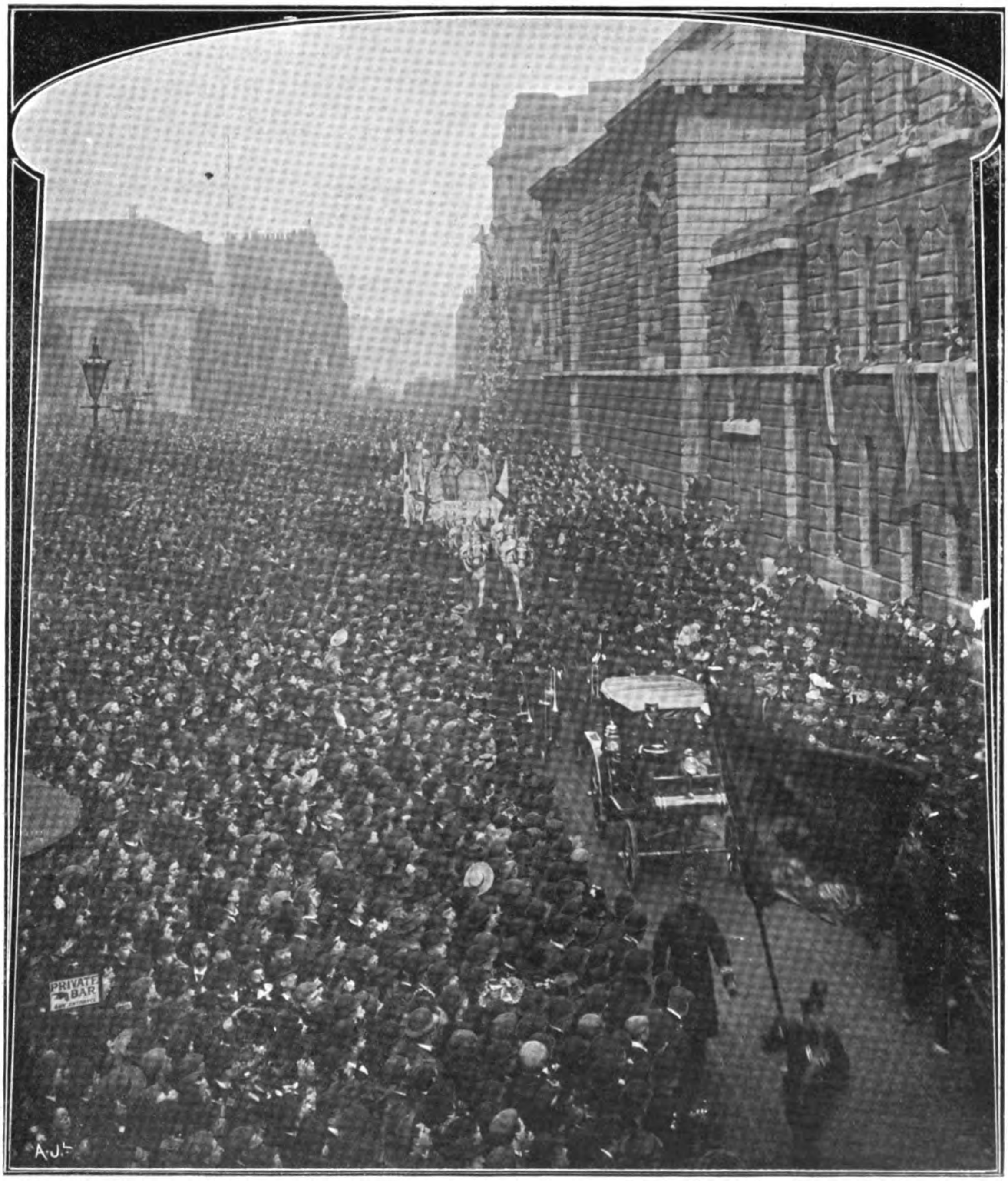

Photograph by Bolak.

A SCENE OF TEN YEARS AGO.—The Lord Mayor's procession of 1896 coincided almost exactly with the emancipation of the self-propelled vehicle from the grandmotherly, or rather step-motherly legislation of which the man with the red flag has become the permanent emblem and symbol. We reproduce an interesting photograph of the Lord Mayor's procession on that day when included in it was a motor car bearing the name of "Present Times," the motor car being preceded by a man waving a huge red flag. This vehicle, which was reproduced in the "Automotor Journal" at the time (Vol. I, page 57), appears in the centre foreground. Our photograph may be said to possess a historical interest from two points of view, as it shows the Lord Mayor's procession proceeding down the Old Bailey and passing old Newgate Prison, which has since been demolished, to make way for the new Central Criminal Court.

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DIARY OF FORTHCOMING EVENTS.

British Events.

April 26	"Lubrication." Paper by Mr. J. W. G. Brooker (Auto-Cycle Club).
May 24	Frome's Hill Climb (Herefordshire A.C.).
May 26	Motor Union Meeting (Birmingham).
June 11-16	Land's End to John O'Groat's (Auto Cycle Club).
June 13-16	Scottish Reliability Trial.
June 30	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July	Motor Yacht Club Reliability Trials.
July 21	Motor Union Meeting (Bath).
Aug.	*Van Trials.
Aug. 6-18	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Sept. 22	Motor Union Meeting (York).
Sept. 27	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

April 1-15	Monaco Motor Boat Exhibition and Races.
April 1-17	Budapest Exhibition (A.C of Hungary).
April 18-26	French Resilient Wheel Trials.
April-May	Milan Exhibition.
May 1-15	Paris Voiturettes Trial (*L'Auto*).
May 6	"Targa" Florio (Sicily).
May 12-24	Tour de France (Motor Cycles and Voiturettes).
May 14-31	Milan Reliability Trial.
May 27	Motor Bicycle Championship (Moto Club de France).
June 6-13	Herkomer Cup.
June 17	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26-27	Grand Prix (A.C. de F.).
June 28-29	Kiel Motor Boat Races.
June 29	Motor Bicycle International Cup Race (Austria).
July 14-17	Ostende Meeting.
July 15	Mont Cenis Climb (Turin A.C.).
July 26-Aug. 15	Circuit Européen.
Aug. 13	Ardennes Circuit.
Aug. 18	Coupe de Liedekerke (Belgium A.C.).
Aug. 26-Sept. 2	Brescia Week (Italian A.C.).
Sept. 10	Florio Cup Race (Italy).
Sept. 15-16	Mont Ventoux Hill-Climb.
Sept. 20	Lake Major Motor Boat Races.
Oct. 5-14	Leipzig Exhibition.

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* Automobile Club of Great Britain and Ireland Events and Papers.

† Members of the Motor Union are admitted free to these Exhibitions on presentation of their cards of membership.

PASSING EVENTS.

Local Authorities and Heavy Traffic.

There has been a distinct tendency lately for local authorities to draw some profit from the somewhat doubtful and shadowy powers supposed to be conferred under the Highways Act of 1878, of recovering damages from the owners of heavy vehicles for the effects of their extraordinary traffic upon the roads. At present it is very questionable what the law intended on the point. Some time ago what was probably regarded by local bodies as a test case—on which we commented at the time—was brought by the Keynsham Rural District Council against a carrying company, which resulted in ignominious failure. Probably other local bodies were awaiting the result of this case, but the result was so emphatic that we have had no more similar prosecutions. Instead thereof we have had a question asked of the Prime Minister in the House of Commons:—

> "Whether the Government propose to introduce during the present session or in an early session of Parliament, legislation to deal with the question of the extraordinary traffic on highways caused by the increase of heavy motors and traction engines using such roads, and to confer greater powers upon local authorities in respect of such traffic?"

The Prime Minister's reply was that

> "The Government do not contemplate proposing any legislation on the subject this session, and they cannot make any promise as regards next session."

This seems to provide one more indication that the attitude of the present Government and the present House of Commons is far from inimical to the automobile movement. Of course, both their attitude on a question like this and in regard to general motor car legislation, in which they have clearly shown that they are by no means anxious to conciliate the anti-automobile cranks, may be to some extent due to the huge legislative programme which they have before them, but as far as a movement like the automobile movement is concerned, those who are not against it are for it, and slight indications like the proverbial straw are of value. It would thus certainly seem that there is no reason to be dissatisfied with the frame of mind of the present Government on the question.

◆ ◆ ◆

A Change of Front?

It is satisfactory to find that the County Council are at last awakening to the merits and importance of the motor 'bus as a factor in dealing with the traffic of our streets. Not long ago they pooh-poohed it. Now they appear to be learning the lesson which the phenomenal success of the motor 'bus everywhere, and particularly on London streets, has borne in on the most unobservant, and seem disposed to recognise that, in putting all their money—we mean their ratepayers' money—on the electric tram, they may have put it, to use Lord Salisbury's celebrated phrase, "on the wrong horse." At any rate, they are going to recognise the motor 'bus to a certain extent, and the Highways Committee is now engaged in considering the question of applying to Parliament next session for power to run services of motor 'buses in connection with their electrical tramways, either as feeders to them on cross routes, or as links of communication between north and south London. Of course, this phraseology is obviously adopted for the purpose of letting down the tramway enthusiasts gently. To introduce the motor 'bus as feeding the tramway termini and assisting the tramways generally, may be regarded as the gilding on the pill—a superficial treatment designed to cover the unpalatable fact that the electric tram is being rendered superannuated by the motor 'bus in London. When the Council's motor 'bus lines begin to pay, they will probably be run not merely to "assist" but to "relieve" the tram service, and then, no doubt, the tram service will become less and less frequent, and the 'bus service more so.

◆ ◆ ◆

Another Suggestive Sign of the Times.

Of hardly less importance to the future of the automobile movement and the travelling facilities of the British public, is the decision of the Police and Sanitary Committee of the House of Commons to allow the Todmorden Corporation powers to run a service of motor 'buses within and beyond the borough. The suggestion is at present that £6,000 should be spent on establishing the service, and if this service is proved to pay, the Local Government Board will then allow the borrowing of any further sums required for expanding the service. Hitherto powers of the kind have been practically confined to electric lighting and tramway enterprise. There are some 800 local bodies who are anxious to obtain a similar privilege, and if the Committee's recommendation is ultimately embodied in a law, no doubt these 800 bodies will be permitted the same privilege and will engage in the same enterprise to the vast convenience of the travelling public and the great benefit of the motor 'bus industry. The London County Council has for so long held aloof from the motor omnibus, that the coincidence of these two new departures, the conversion of the central municipal body and the Parliamentary grant to provincial councils of powers to organise motor 'bus services, can hardly fail to have a most far-reaching effect in inducing local bodies to speedily adopt the motor 'bus on an extended scale.

◆ ◆ ◆

The Ambulance in the City.

One cannot altogether congratulate the City authorities on their attitude towards the new locomotion, at any rate as far as the application of the motor to the propulsion of ambulances is concerned. There was a meeting of that august body, the Court of Common Council, last week at the Guildhall, and amongst other subjects brought up for discussion the Police Committee recommended the adoption of horsed ambulances for use in the City. After a tough fight the Police Committee got the proposal through, the not very extravagant sum of £1,850 being voted for the initial cost of a scheme for providing several ambulance stations and a horsed ambulance; so now the great, ancient, and wealthy Corporation of the City of London will be able to boast that it is in possession of one actual, real, and existing horse-drawn ambulance. As a great concession, power was conferred on the Police Committee to "consider the *question*" as to whether or not motor ambulances should be provided. We should have thought there was no "question" about the matter. Even the London County Council, whose attitude towards motor traction is cautious, to say the least of it, have commenced establishing a motor ambulance system for the regions of London under its control. That the City should only have one horsed ambulance and no motor ambulances at all, and should merely be *considering* the adoption of these latter as a question for discussion, contains a decided element of the ludicrous at the present day.

A Warning from the Past.

The Royal Commission appointed by the late Government to inquire into and report upon the whole motor car question is still sitting. But before long, it may be but weeks, probably not more than months, and almost certainly before the end of the year, it will furnish its report. No one can form more than a guess at present as to what the nature of that report will be, but that it will in the near future lead to legislation, which may profoundly modify the present law, and in consequence will affect vitally the whole future of the automobile industry in this country, can be almost taken for granted. During this interval of waiting, therefore, it was an extremely happy idea of Mr. Cozens-Hardy to draw attention, in a paper read before the Norfolk Automobile Club on Friday in last week, to the lessons of nearly eighty years ago, when the automobile in a practical form made its first appearance on British roads. Those were the days when the old steam vehicles, wonderful to relate, carried regularly between Cheltenham and Gloucester and between Paddington and the Bank, loads of as many as fourteen passengers, and actually attained speeds on the road in some instances of 35 miles per hour. Then, as now, a Royal Commission was appointed, and this Commission furnished a singularly open-minded, unprejudiced report, a report which may even be described as enthusiastically in favour of the new locomotion. It is consequently of high interest to put on record what the findings of this Committee, as unearthed by Mr. Cozens-Hardy, were.

1. That carriages can be propelled by steam on common roads, at an average rate of ten miles per hour.
2. That at this rate they have conveyed upwards of fourteen passengers.
3. That their weight including engine, fuel, water, and attendants may be under three tons.
4. That they can ascend and descend hills of considerable inclination with facility and safety.
5. That they are perfectly safe for passengers.
6. That they are not (or need not be if properly constructed) nuisances to the public.
7. That they will become a speedier and cheaper mode of conveyance than carriages drawn by horses.
8. That as they admit of greater breadth of tyre than other carriages, and as the roads are not acted on so injuriously as by the feet of horses in common draught, such carriages will cause less wear of roads than coaches drawn by horses.
9. That rates of toll have been imposed on steam carriages which would prohibit their being used on several lines of roads, were such charges permitted to remain unaltered.

◆ ◆ ◆

An Awful Example.

If human affairs, or, at any rate, British affairs, were (or then had been) conducted on anything approaching rational lines, so strong a report from a Select Parliamentary Committee would have at once been followed by legislation which would in all human probability have had the effect of making Great Britain the leading automobile manufacturing country of the world. But nothing of the kind took place. The campaign for the extermination of the automobile by levying preposterous tolls, amounting, in some cases, and for a long journey, to as much as 30*s.* or even 48*s.* per every seven miles run, had been already commenced. After such a report, one would have expected Parliament, even if not prepared with constructive legislation on the question, at any rate to have put a stop to such injustice as this. Not a bit of it! The report was laid on the table of the House, Parliament took no notice of it, and the toll-takers were allowed to snuff out the budding industry by their scandalous and iniquitous exactions. It is a painful lesson, and it comes with special appropriateness now, when for the second time, after the lapse of nearly a century, another Commission is reporting on almost identically the same question. We do not think there is now any serious danger, for, as we have often pointed out, one of the great differences between now and then is that now the automobile industry has established itself abroad. But it is well that automobilists, in Parliament and out of it, should have this awful example of fatuous imbecility to wave in the faces of the reactionaries.

◆ ◆ ◆

The Motor 'Bus and the Motor Tram.

The general interest felt in the motor 'bus question has recently been productive of three important papers devoted to the subject. With the first of these, by Mr. Norman Macdonald, we dealt editorially at some length last week. Since then both Mr. Worby Beaumont and Mr. E. Manville have been expressing their views at length, the former to the Automobile and Cycle Engineers' Institute on Wednesday last, and the latter to the Automobile Club on the following evening. Mr. Worby Beaumont devoted his attention to the main principles involved in successful motor 'bus running from the traffic management and mechanical points of view. An excerpt of his paper, in which we have included such portions as are likely to appeal to users rather than manufacturers only, appears on another page. Mr. Manville's paper, of which we also give a comprehensive abstract, is sure to attract even more attention. As the Chairman of the Daimler Company, and himself an enthusiastic automobilist, while at the same time a member of a firm of consulting engineers who are particularly associated with electric tram development, he is in a position to approach the subject with a considerable degree of impartiality, and he is certainly in a specially good position to estimate, as he does, the actual costs of electric tram construction and running. On the whole his paper is distinctly fair, even though some of the arguments used may be thought to betray a bias in favour of the electric tram as compared with the motor 'bus. And this view seemed to be taken by a number of those who joined in the subsequent discussion, a discussion which constituted the most comprehensive and exhaustive debate which has ever followed the reading of a paper at the A.C.G.B.I. The interest taken in the subject was, in fact, such as to lead to a postponement till the next Thursday evening meeting of the Club. Of special importance and interest are the comparative balance sheets which Mr. Manville produces of a year's tramway working in the town of Leicester and an imaginary similar service of automobile 'buses. While the former is shown to have produced a profit of upwards of £2,300, the latter is credited with accumulating a loss of upwards of £37,000. Apart from the question whether the conditions prevailing at Leicester can be regarded as normal, and suited to purposes of comparison, it will at once be recognised that, in the motor 'bus balance sheet, the figures for tyre renewals and depreciation of vehicles alone account for nearly £53,000, which is a good deal over the estimated loss. These are, of course, *the* items which are most serious nowadays, but they are items which there is every reason to hope will be considerably reduced in the near future. However representative and accurate Mr. Manville's figures and deductions may be, his paper is certainly well worth the careful perusal of all those who are either directly or indirectly interested in the future of motor 'buses.

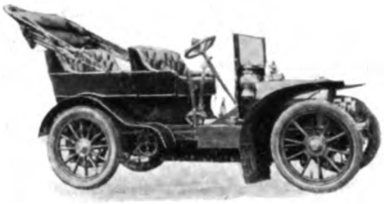
How to Recognise the Cars of To-day.

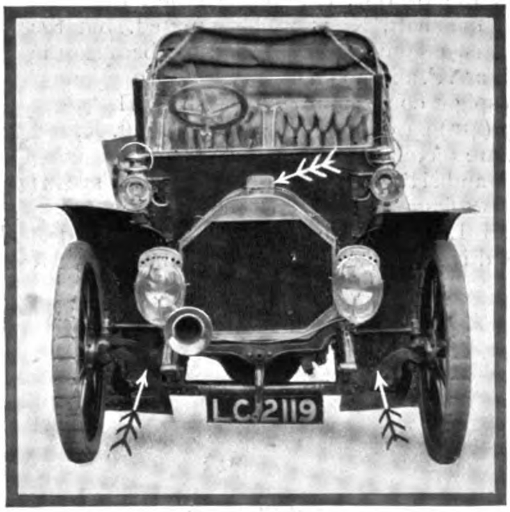
(No. 17).

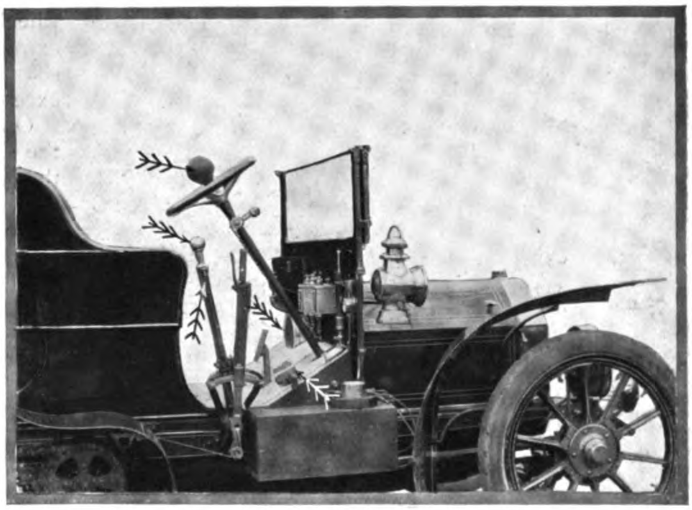
The Brotherhood

(BRITISH)

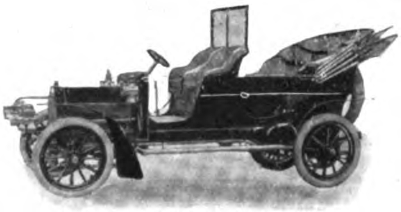
20-25 H.P.







The Brotherhood CHANGE-SPEED-LEVER is very striking in appearance. Other details by which these cars may be identified, are the CONTROL PEDAL on the floor board, THE ALUMINIUM DISTRIBUTOR BOX on the dash, and the position of the HOOTER-BULB IN THE CENTRE OF THE STEERING WHEEL. In front, there is a name plate on the dash, and the radiator as well as the curved front axle are very distinctive.



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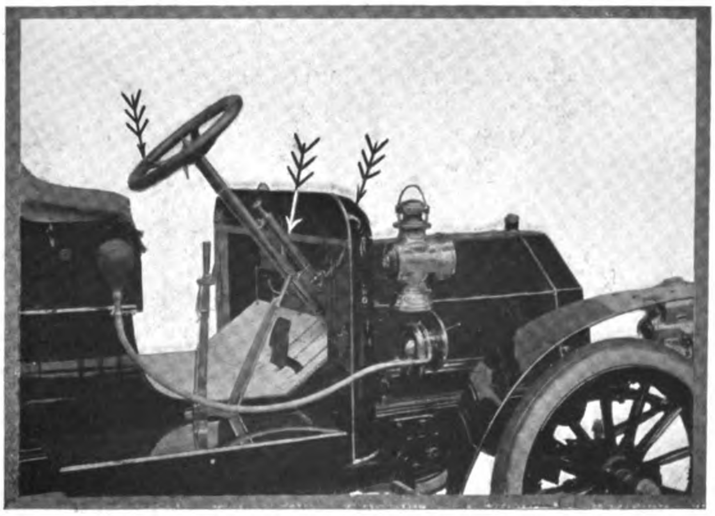
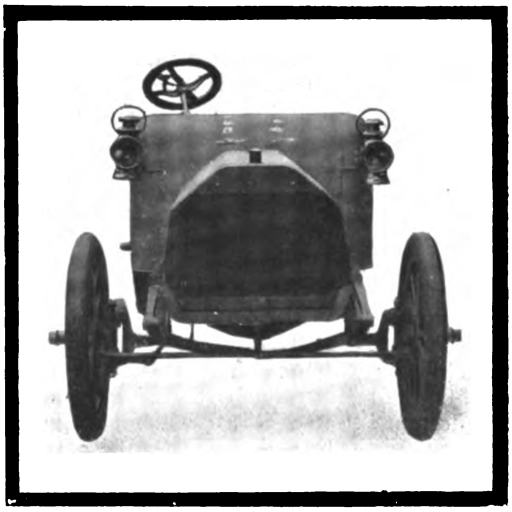




The CURVED DASH and the honeycomb RADIATOR, WHICH IS WIDEST AT THE BASE, are very noticeable. A very distinctive detail, however, is the arrangement of the PRESSURE PUMP ON THE STEERING COLUMN; the single CONTROL LEVER above the wheel is also of an unusual shape.

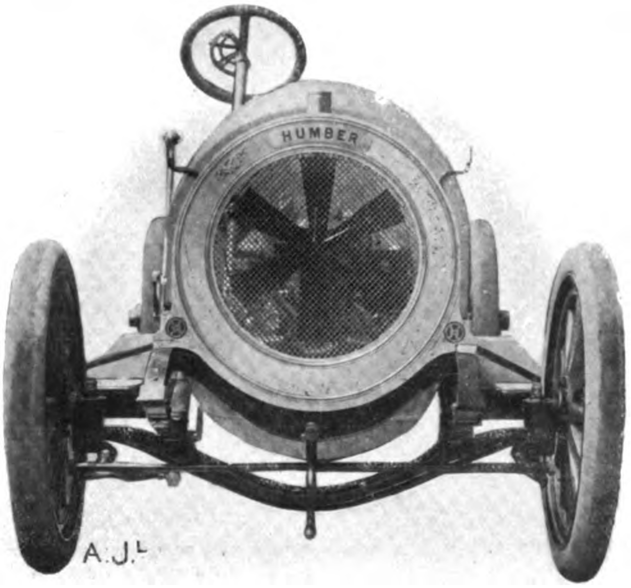
THE HUMBER PETROL CARS.

FOUR AND SIX-CYLINDER MODELS.

(*Continued from page* 378.)

The Gear-Box.

Both the four and the six-cylinder models have gear-boxes of similar design, except that there is a slight difference in the method of support to suit variations in over-all dimensions of the chassis; as regards the mechanism, however, there is no distinction between them. The box-casting is divided horizontally, and is supported by feet cast on the top half. Four speeds and a reverse are available, and the arrangement of the gears is on what is known as the "Mercedes" principle, because it was on those cars that the system of using two sliding members instead of one (*i.e.*, Panhard system) was first adopted. Thus in the Humber gear-box the first and second-speed gear-wheels, H^2 and H^3, form one complete unit, and the third and fourth speeds, H^4 and H^5, form another. Each is operated independently, as is also the "reverse," which is quite independent of the forward speed. Thus in changing gear the car may be started in any speed, and the gear may be changed direct from one speed to any other without running through the intermediate gears.



The 30–40-h.p. Humber Car. Front view of the new 6-cylinder model showing the circular radiator which is a distinctive feature of this vehicle.

On the top speed the drive is direct from the engine to the back-axle, and there are three low speeds and one reverse on which the drive is taken through a lay-shaft. Ball-bearings are fitted to both the shafts, and a feature of the Humber gear-box is the use of double-ring bearings at each end of the "through shafts," and the provision of an additional bearing, K^4, to support the inner end of the engine-driven shaft, K. This latter bearing is very prominent in our photograph (Fig. 10), and is equally clear in the line drawing (Fig. 11), which gives a better idea of the construction of the double-end bearings, K^2 and H^1. These end bearings are each formed by a pair of single-ring bearings enclosed in sleeves, which have detachable oil-tight caps. The ball races are secured to the shaft by lock-nuts and distance pieces in the usual way. A single ring forms the additional bearing, K^4, and the ball races of this are of the two-point type, as are those of the others. With the double bearing, K^2, on one side, and the bearing, K^4, on the other, the spur-wheel, K^1, on the shaft, K, is well supported, but the extra bearing is a commendable addition, because the shaft, K, ends at K^5, and would otherwise be "overhung" except for its spigot connection with the shaft, H.

On the top (4th) speed the engine-driven shaft, K, and the shaft, H, are directly coupled together by engaging the jaws, K^6 and H^6, but on all the other speeds the power is first transmitted through the gear-wheels, K^1 and L^1, on to the lay-shaft, L. From the lay-shaft the drive is taken back on to the shaft, H,

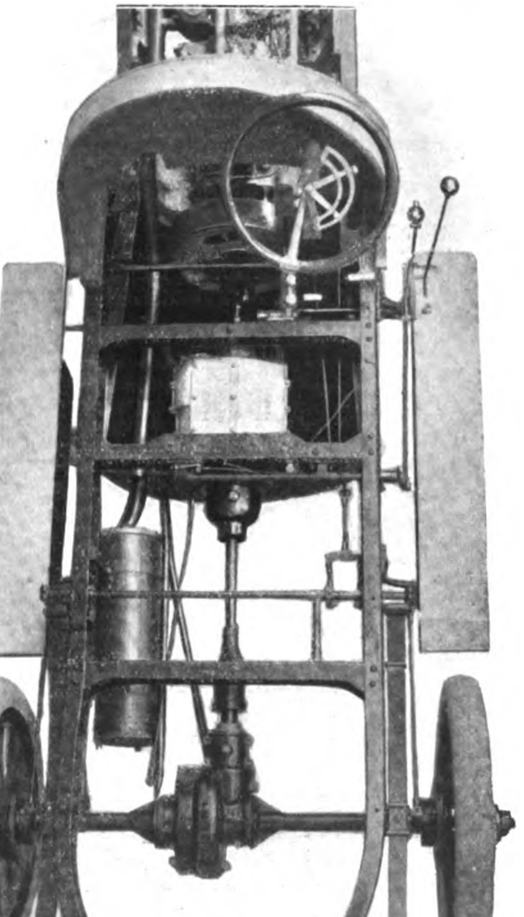


Fig. 10.—The 30-40-h.p. Humber Car. View of the chassis looking from above. Only that part which is behind the dash is included in this view, which clearly shows the arrangement of the transmission mechanism and the peculiar shape of the frame at the rear.

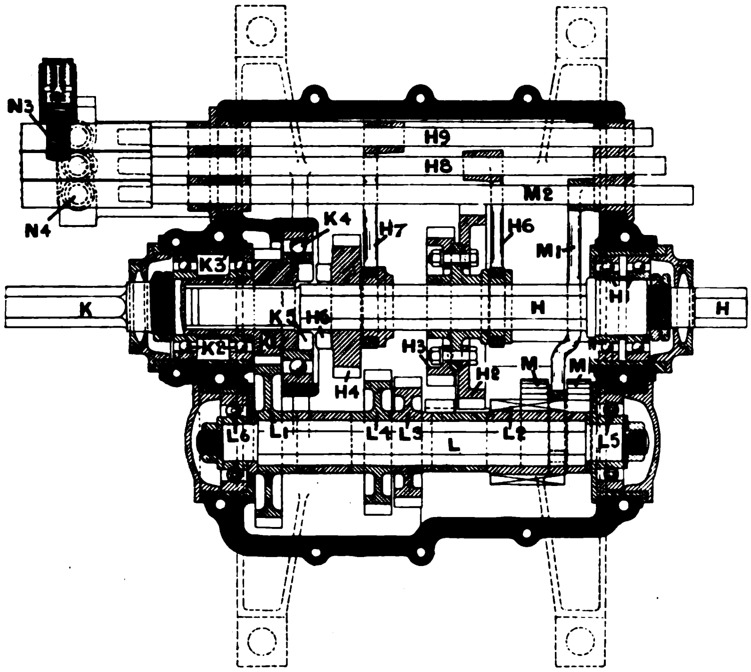


Fig. 11.—The 16-20-h.p. Humber Car. Line drawing showing the construction of the gear-box. The double bearings at each end of the "through" shaft and the intermediate bearing, K^4, are special features of the Humber gear-box, which is similar on both the 16-20 and the 30-40-h.p. models.

through whichever one of the speeds, L^2, H^2, L^3, H^3, L^4, H^4, happens to be engaged at the time. Of these, the gear-wheels, L^4 H^4, give the third speed, while the second and first speeds are given by the gear-wheels, L^3 H^3, and L^2 H^2, respectively. The gear-wheels on the lay-shaft are stationary, each wheel being held rigidly in place on the hexagon shaft by sleeves forming distance-pieces; it is therefore on the hexagon-shaft, H, that the gear-wheels slide when changing speed. There are, as has been mentioned, two sliding members, one being formed by the first and second speeds, the other by the third and fourth speeds, and each is connected by forked arms, H^6 and H^7, to the sliding rods, H^8 and H^9, which are independently operated by the change-speed-lever. When the "reverse" is required, the change-speed-lever is engaged with the rod, M^2, which slides the wheel, M, by means of the forked arm, M^1, into mesh with the wheel, H^2. This wheel, M, lies below the lay-shaft, and is always in mesh with the wheel, L^2. It is also so arranged that it will mesh with the wheel, H^2, while that member is in its neutral position. It is in order that it may bridge the gap between these two wheels, L^2 and H^2, that the wheel, M, is made so wide, but it is because the centre part is turned down to receive the fork, M^1, that it has the appearance of being two wheels instead of one, in Fig. 11.

The connection between the change-speed-lever and the sliding-rods, H^8, H^9, and M^2, is carried out in the usual manner by sliding the change-speed-lever sideways, so that it is temporarily engaged with either of the rods. The motion of the change-speed-lever is guided by the gate-quadrant, and there are spring catches, M^4, beneath each rod which lock them in position. These spring catches are placed immediately beneath the ends of the rods, and a screw adjustment is provided by which the driver can at any time tighten them, should he find that there is a tendency for the gear to come out of engagement of its own accord. There is also a stop for preventing the lever being accidentally put into the reverse slot, and this, on the 4-cylinder chassis, is fitted to the "gate" itself in the form of a hinged flap, which can be moved by hand.

On the 6-cylinder car, however, the catch, N^1, is put in a different place, and is connected to a small pedal, so that the driver need not stoop down in order to release it. This latter arrangement is shown in Fig. 12. Normally the sliding-rod connected to the change-speed-lever is held up against this catch by the spring bolt, N^3 (Fig. 11), and it is this bolt which positively locks the other rods in their neutral position whilst any one of them is in use.

The Universal-Joints.

Immediately behind the gear-box is a universal-joint enclosed in an aluminium case, and between the gear-box and the clutch is a similar joint, but not enclosed. At the far end of the propeller-shaft is another universal-

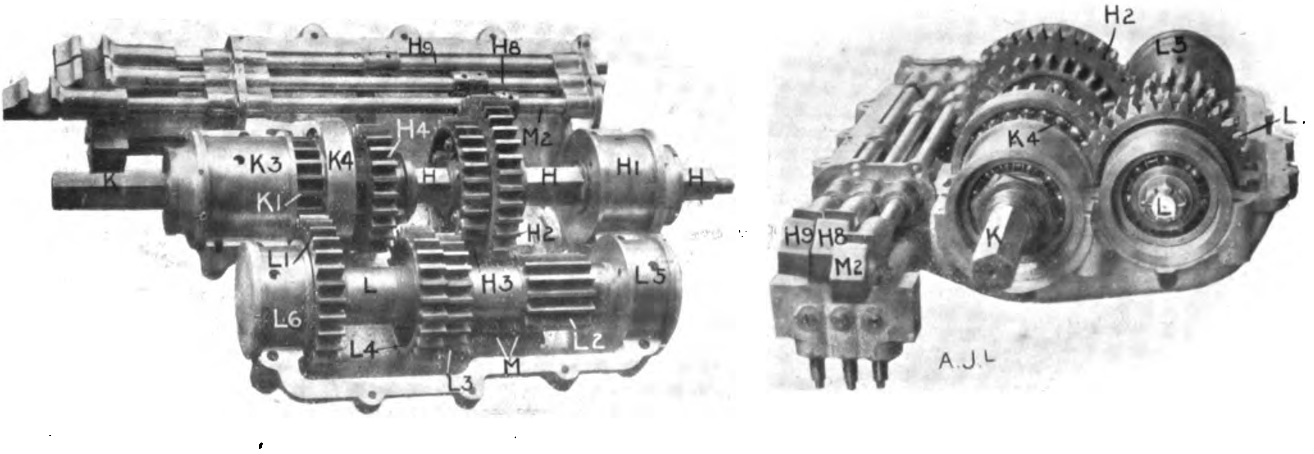


Fig. 12.—The 16-20-h.p. Humber Car. Views of the gear-box after the top half has been removed. The two sliding members and the additional bearing, K^4, are prominent in this illustration.

joint, but of a different pattern. Of these the two former are of the ordinary double-jaw type, in which the jaws are coupled together by an intermediate four-armed spider. That at the far end of the propeller-shaft, on the other hand, is a telescopic joint as well as being universal, the former feature being necessary in order to allow the effective length of the propeller-shaft to automatically accommodate itself to the varying deflection of the springs as the car travels over obstacles. This joint is of very simple and strong construction. On the end of the propeller-shaft is a knuckle carrying a short Tee-piece, and the arms of the Tee engage in slots cut in the walls of a sleeve which is fixed to the spindle, E (Fig. 5). The propeller-shaft is thus free to lie obliquely to the spindle, E, and its end can also move in and out of the sleeve as occasion requires. Normally the axis of the spindle, E, does not vary its position, but under suddenly-applied driving strain it would do so slightly if the whole axle casing were rocked over against the action of the spring-suspended torque-rods, F^2.

(*To be concluded.*)

The Funeral Up-to-Date.

A MOTOR car, which can now no longer, whatever may be said against it, be credited with a funereal pace, is hardly the kind of conveyance which one expects to see in a cemetery taking part in a funeral, particularly when it rushes up to the cemetery chapel at a considerable rate of speed. Such a phenomenon, however, might have been observed by those who took part in the obsequies of Archdeacon Taylor, at Anfield Cemetery (near Liverpool), recently. The service was to be read by the Bishop of the diocese with two assistant clergy. The funeral had already arrived at the cemetery before the Bishop and his assistants, but the situation was saved by the timely arrival of his Lordship and the two clerics with him, all in full canonicals, who came upon the scene at anything but an orthodox pace, under the circumstances, in an up-to-date automobile.

The Perpetual Motion of the Motor 'Bus.

WE have all laughed at the remark of the Irishman that " motor 'buses go so fast that no one can get into them, and never stop to let anybody out." It is refreshing, therefore, to find that a learned County Court judge, to wit, His Honour of the Westminster Court, is of the same opinion. In a recent case which came before him, in which a litigant claimed for damages sustained by his jumping on a 'bus, which refused to slow down for his convenience, the plaintiff stated that the 'buses never do stop. Counsel for the defence saying that he had seen them do so, the Judge added, "I never have." As a matter of fact, motor 'buses have stopping places, which those acquainted with their habits know, but owing to the fact that they are usually cram full, they very rarely stop between these points, while when no one wishes to get out of them, it must be admitted that even these supposed stopping places are often ignored. So perhaps this is the ground of the popular misconception. As more motor 'buses come into traffic and compete for patronage, doubtless they will modify something of this haughty and independent demeanour.

NICE AUTOMOBILE WEEK.—Although the speed events for racing cars have been eliminated from the Nice motor festivities, the other items of the programme create a vast amount of public interest. The opening event of the week, the " Corso Fleuri " took place on Sunday last, a splendid lot of decorated cars taking part. Comte Zapolski, with his Delaunay-Belleville car, secured the first prize. We give a photograph above of this charmingly decorated vehicle.

A SCIENTIFIC TYRE LEVER.

(*Concluded from page* 382.)

Mounting the Cover.

It will now be assumed that a new cover is to be placed on the rim, an inner tube inserted, and then that both have afterwards to be removed. Sometimes it is possible to place as much as half the inside beading in the rim by hand, but with very stiff covers less than half can only be put in place readily without resorting to the use of levers. In any case, however, the operation of mounting the remainder is the same as that represented in Fig. 3, only it is sometimes advisable to start by putting on only part at a time instead of all at once. With the inner beading in place, the security bolts must be inserted, which gives the first occasion for the use of the hook, F. This operation is clearly indicated in Fig. 4, although for photographic purposes the valve-hole is here shown exposed instead. Attention may here be drawn to the fact that in all these photographs the levers actually remain, and are intended to remain, in the position shown without any artificial support. This is one of the strong points of the outfit, because it facilitates in no small degree its single-handed use.

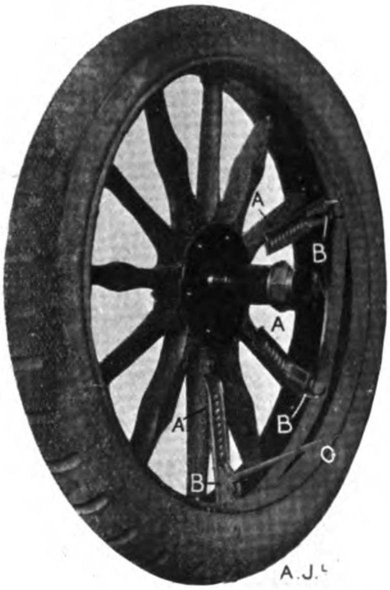


Fig. 3.—Mounting a Tyre. View showing the first application of the Helena tyre levers in the process of placing the cover on the rim.

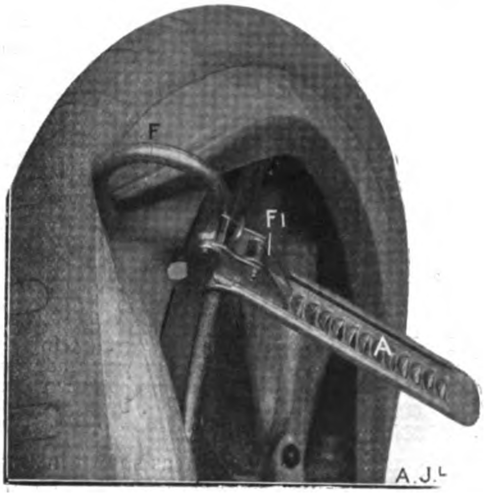


Fig. 4.—Mounting a Tyre. View showing how the hook is used to lift the cover free from the valve-hole in the rim.

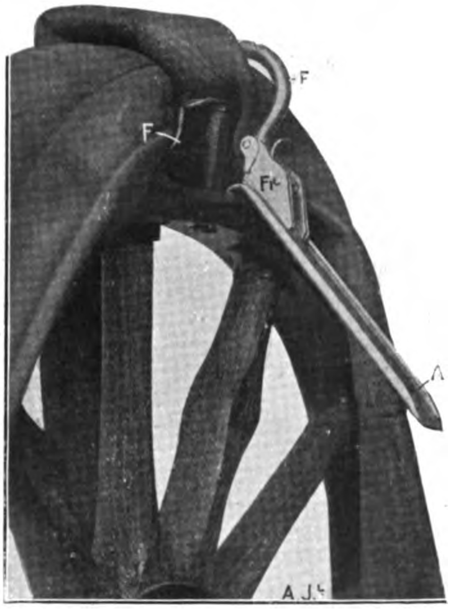


Fig. 5.—Mounting a Tyre. View showing how the tube should be arranged prior to inserting the valve.

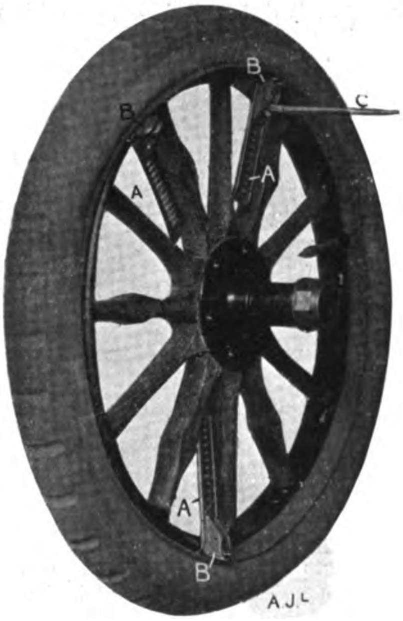


Fig. 6.—Mounting a Tyre. View showing how the levers are used to mount the near side of the cover. The centre lever is that which is moved to the next position each time that a fresh length of beading is ready to be slipped over the rim.

Inserting the Tube.

After the security bolts are in place, the valve of the inner tube needs to be put in, and for this purpose the same hook, F, is, of course, again brought into play. Prior to raising the beading of the cover, it is obviously necessary to remember to pass the tube under the big bend in the hook—as shown in Fig. 5—otherwise it is difficult to insert the valve-stem without unnecessarily doubling up the tube. One other little detail, which it is also desirable not to forget, is that much inconvenience may be saved if in the first instance great care is taken—when placing the cover in contact with the rim, initially—to see that the notch in the beading exactly corresponds with the valve hole in the rim. If this point is attended to, there will be no need to pull the tyre round by hand afterwards; the use of the tools tends to prevent, rather than otherwise, the accidental shifting of the cover whilst it is being mounted.

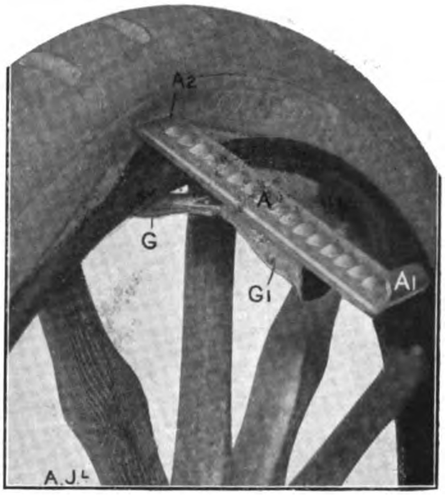


Fig. 7.—Dismounting a Tyre. View showing the application of the strap-attachment to the initial loosening of the cover on the rim.

Once the valve stem is in place, it is a straightforward matter to put the remainder of the tube in position, when, after pumping in a little air just to take out the creases, and to assist the tube in keeping itself out of the way, the near beading of the cover can be slipped over the rim. This latter operation is performed on exactly the same lines as when mounting the far side of the tyre. The actual use of the levers for the purpose is illustrated in Fig. 6, in which the chief points to be observed are that the first portion to be mounted should be that opposite the valve, and that three levers should be employed for the process, the two outer levers being left in place while the centre one is removed to a fresh position.

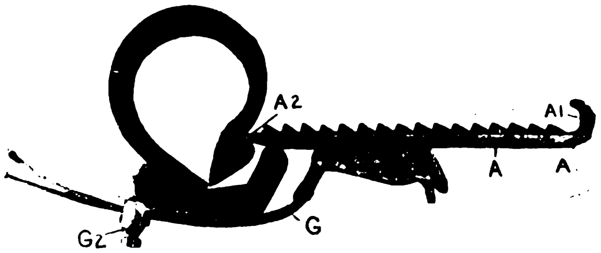


Fig. 8.—Dismounting a Tyre.—Diagrammatic view demonstrating the manner in which the strap shown in Fig. 7 is attached in place.

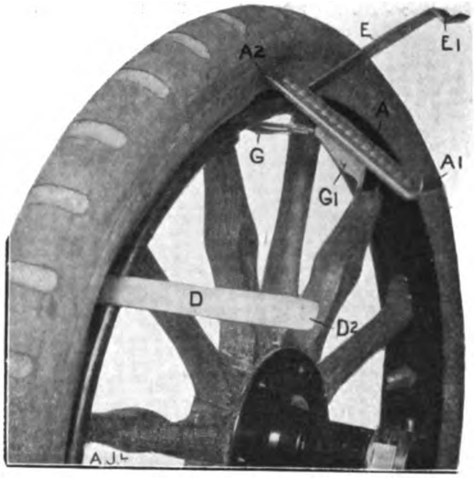


Fig. 9.—Dismounting a Tyre. View showing the arrangement of the "slides," D, to enable the first part of the cover to be pulled over the rim.

Dismounting the Cover.

Dismounting the tyre is an equally simple process, but it calls into play a different set of tools. First and foremost it is, of course, necessary to loosen the beading of the cover from the rim, which is not always quite as easy as might be expected. A special device has therefore been included in the "Helena" outfit in order to enable a very considerable purchase to be obtained; it consists of a strap, G, fitted with a small hook, G^2, which can be temporarily attached to the rim as shown in Fig. 7 and more diagrammatically in Fig. 8. This strap is, by means of its carrier, G^1, used in conjuction with the special ladder, A, which has the curved end, A^2. Ordinarily it is sufficient to adjust the tool approximately, and to use the ladder itself as a hand-lever for loosening the beading. Sometimes it happens, however, that the

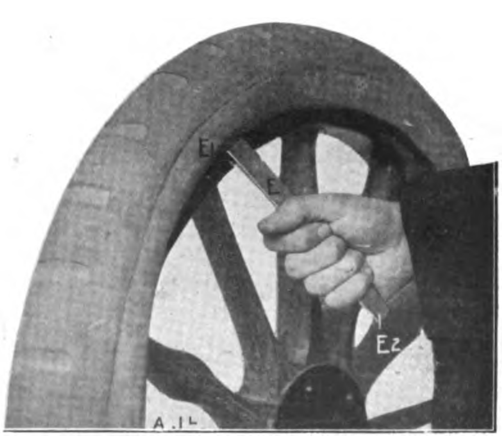


Fig. 10.—Dismounting a Tyre. View showing the use of the Lever, E, for removing the remainder of the beading after the preliminary portion has been taken off as indicated in Fig. 9.

tyre is too stiff, in which case resort has to be made to the lever, C. When the beading has by this means been forced back a short distance, the plain end, E^2, of the lever, E, is inserted under it, and the strap removed to its next position.

If properly used it will be found that although the beading of the tyre can easily be forced quite clear, yet the tongue itself will not leave its contact with the rim; the lever, E, cannot consequently actually come in contact with the tube when it is inserted in the manner explained. This point is most clearly illustrated in Fig. 8, which shows how the beading is tipped up for the insertion of the lever. This use of the lever, E, is only momentary, for it is merely a means of easily inserting one of the special levers, D, in the manner also shown in Fig. 9. These levers, D, may be pushed home as far as they will go, for they are not liable to damage the tube. With two of them placed fairly close together, the part of the cover between them may be pulled off by hand and the remainder unpicked by running the bent end of the lever, E, round the rim, as shown in Fig. 10. For the removal of the tube, the same hook-device, F, is again brought into play, as in Fig. 5, while the removal of the far side of the cover is also an easy matter, after taking out the security bolts, if the lever, E, and the slides, D, are used in conjunction with one another.

* * * *

The Daimler Company's Chairman.

It is with regret we learn that Sir Edward Jenkinson, K.C.B., has resigned the Chairmanship of the Daimler Motor Co., which he has held for upwards of five years. Although the guiding hand of Sir Edward will be greatly missed, it should be a cause for considerable congratulation to the shareholders to know that so able and experienced a business man as Mr. Edward Manville has been elected by his co-directors as Sir Edward Jenkinson's successor.

A Coming "Gearless" Car.

Within the last fortnight it has leaked out in the Press that a new Napier car is in course of construction, and that this vehicle is to have no change-speed gear of any kind, the whole of the driving—including starting—being done direct from the clutch to the differential-gear. We have for some time known of this latest development on the part of the Napier Company, but were informed of it in confidence by them, for they have not even yet quite completed their experimental work in connection with it, and are therefore not ready to have any description published. Very shortly, however, we hope to give full particulars of this interesting departure, as we are to make a practical trial with it as soon as it is finally on the road.

Motor 'Bus Traffic and the Police.

Complaints having been made by the Marylebone Borough Council in regard to the noise of motor 'buses passing through their domains, the Commissioner of Police has replied:—

> "The whole industry is at present in an experimental stage, and the Commissioner is satisfied that both manufacturers and proprietors are seeking for a type which will be free from the defects at present noticeable.
>
> "On this account, therefore, and to avoid hampering unduly a young and important industry, it is essential that the police should interfere with circumspection, while endeavouring to ensure that there shall be no unnecessary annoyance resulting from the presence of motor omnibuses in the streets of London."

The Commissioner of Police, in fact, is favourably inclined to the automobile movement, and is most courteous and studiously considerate in dealing with any fresh police regulations, seeking at all times to avoid any unnecessary restriction likely to hamper progress. Several of the drivers employed in the force for driving his cars and other vehicles used for dispatch purposes have, by agreement between the Commissioner and the Automobile Club, presented themselves as candidates for the Club's driving and mechanical proficiency certificates. The Commissioner is thus supporting, as far as he can, the Club's scheme for providing a supply of adequate and competent drivers.

A Well-Advised Appeal.

Our readers will call to mind (and there are few who are likely to have forgotten the incident) the tremendous damages awarded in the High Court against Mr. F. W. Bailey, who, in the neighbourhood of the Crystal Palace, had the misfortune to be concerned in an accident resulting in the death of a cyclist. In an action brought many months subsequently, £1,500 damages was awarded to the widow of the cyclist in compensation. The opinion of counsel (Mr. Tindal Atkinson) has recently been taken, and he advises that there was a miscarriage of justice in the case. Mr. Bailey has accordingly determined to appeal, and the Motor Union has resolved to support Mr. Bailey, and has determined to contribute to his assistance in all the sum of £30.

Another Case of Assistance.

In another case, in which a member of the Union had, in that body's opinion, been unfairly prosecuted on the charge of driving at a dangerous speed, and in which the charge—one that ought never to have been brought—was dismissed, the Union have determined to contribute half the costs to which the motorist in question was most unjustifiably put. We have often drawn attention to this legal scandal before, but we can scarcely do so too often, so that we will once again repeat that for a man to be put not only to serious inconvenience and annoyance, but to considerable expense, by a charge which magistrates ultimately dismiss, is a crying scandal which ought to engage the attention of the Legislature at the earliest possible moment.

Chauffeur's Commission.

In a recent case before a London County Court, the purchaser of goods from a motor car depôt discovered that his chauffeur, who had doubtless been instrumental in inducing him to order them—the total came to some £150—had received a "present" or commission from the firm of £5. The Judge, when he heard this, said "the sooner this sort of thing is stopped the better." The chauffeur's master counterclaimed for this amount, but in spite of his expression of opinion, the Judge, in giving judgment, declared that the purchaser had not in any way suffered by reason of the firm's action in giving the chauffeur commission. It seems an extraordinary thing that a Judge should put such a judgment on record. Surely, if in every case where a commission is paid, there must be proof that someone has suffered damage or injury, there would be no such thing as illicit commission in the world, and Lord Russell of Killowen's Act must be labelled, as in practice it largely is, as a dead letter.

THE CRITCHLEY-NORRIS PETROL 'BUS.

(*Concluded from page* 380.)

The Change-Speed-Gear.

In Fig. 8 a horizontal cross section is given of the gear-box, while in Fig. 9 is a front elevation, and in Fig. 10 is a vertical cross-section through the differential countershaft. The most striking feature of the gear-box is that it is formed by one single casting, F^4, which is fitted with one large end plate, F^8, at the front end, and two flanged castings, F^6, on either side of the differential. The entire gear, with the exception of the large bevel, C^5, is slid into place through the openings that are normally covered by these three cover plates. Similarly the three operating rods, F^1, F^2, and F^3, which control the 3rd and 4th, the 2nd and 1st, and the "reverse" speeds, respectively, are held in place with their guide bearings, by the light cover, F^7, on the right side. The gear-box is, therefore, not divided into two parts as is usual, but it is nevertheless cast with very large inspection openings above the mechanism, these openings being fitted with flat lids.

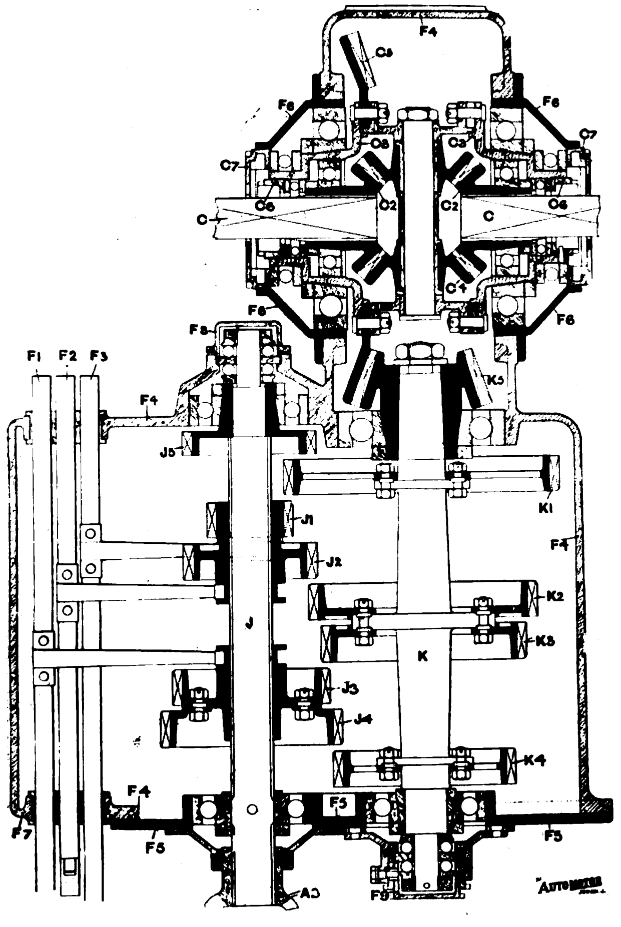


Fig. 8.—Horizontal section through the Critchley-Norris gear-box, which is formed by one large casting and has ball-bearings for the differential-gear bevel-wheels, as well as for all the shafts.

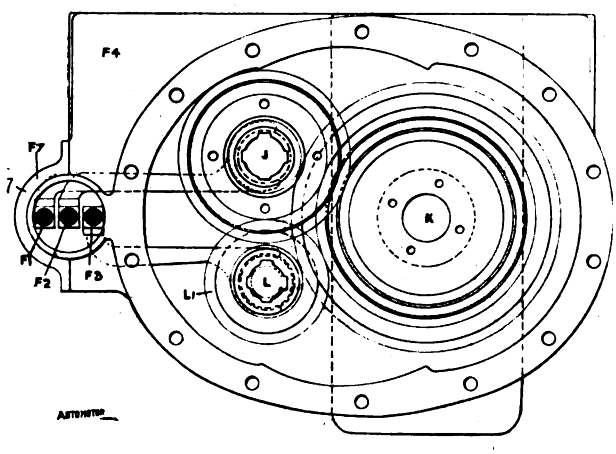


Fig. 9.—Front elevation of the Critchley-Norris gear-box.

The gear is arranged on the well-known "Mercedes" principle, the first-motion shaft, J, carrying a coupling, A^3, at its front end, whereby it is driven by the propeller-shaft, A, and having sliding spur-wheels, J^1, J^2, J^3, and J^4, mounted on four keys that are solid with it. The wheels, J^1 and J^2, are fixed together, so that this sliding unit can be made to engage with the wheel, K^1, or the wheel, K^2, on the second-motion shaft, K; similarly, the wheels, J^3 and J^4, are fixed together and are capable of being brought into mesh with the wheels, K^3 or K^4, on the shaft, K. As usual, too, the second-motion shaft, K, is fitted with a bevel-pinion, K^5, at its rear end, this meshing with the large bevel-wheel, C^5, which is securely fixed to the shell, C^3, of the differential-gear. For providing a "reverse," the wheel, J^5, is securely fixed to the shaft, J, while, as seen in Fig. 9, the intermediate spur-wheels, L^1, are carried beneath on the feather-keyed shaft, L.

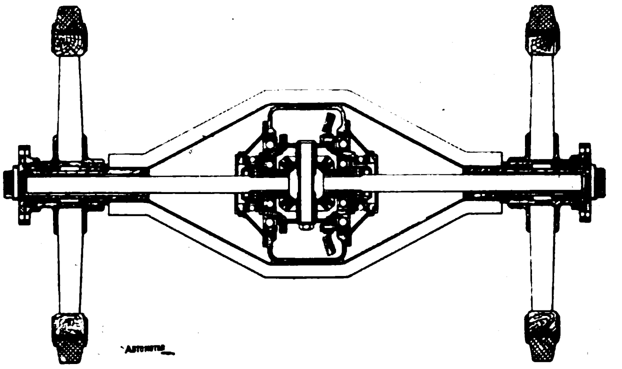


Fig. 11.—Sectional drawing showing the application of the Critchley-Norris design to a live-axle vehicle.

Both the shaft, J, and the shaft, K, have extremely large ball-bearings for supporting them at each end, the outer members of these bearings sliding into place in the main castings, while the inner members are rigidly fixed by conical sleeves to the shafts. At the rear end of the shaft, J, and at the front end of the shaft, K, there are also double ball-thrust-bearings, which are rendered accessible for adjustment by the screw caps, F^8 and F^9, respectively.

It will be noticed from the drawings that the shafts, J and K, together with their gear-wheels, can be drawn out by removing the end plate, F^5, after having disconnected the thrust-bearing that lies beneath the cap, F^8, the whole of this mechanism being then free to slide forward without disturbing the gear-box. The sliding spur-wheels can be rendered free from the engagement forks that control them, and these forks (complete with their rods) can at any time be removed by merely taking off the cover, F^7, and lifting them out sideways.

Similarly, the differential-gear can be removed after the covers, F^6, have been taken off, for it is only necessary to unbolt the bevel-wheel, C^5, and the entire mechanism can be slid out sideways. Another particularly interesting characteristic of this portion of the mechanism is that the opposing bevel wheels, C^2—which form the "sun" members of the differential—are carried in ball-bearings inside the shell-casting, C^3, and also have ball-thrust-bearings behind them. These bevel-wheels can be brought into exactly correct mesh with the planet wheels, C^4, by the adjustment-nuts, C^6, behind the thrust-bearings. In precisely the same manner, the differential-gear as a whole is carried in ball-bearings within the cover castings, F^6, and the large bevel-wheel, C^5, can be adjusted so as to accurately mesh with the bevel-pinion, K^5, by adjusting the collars, C^7, that lie outside the two ball-thrust-bearings.

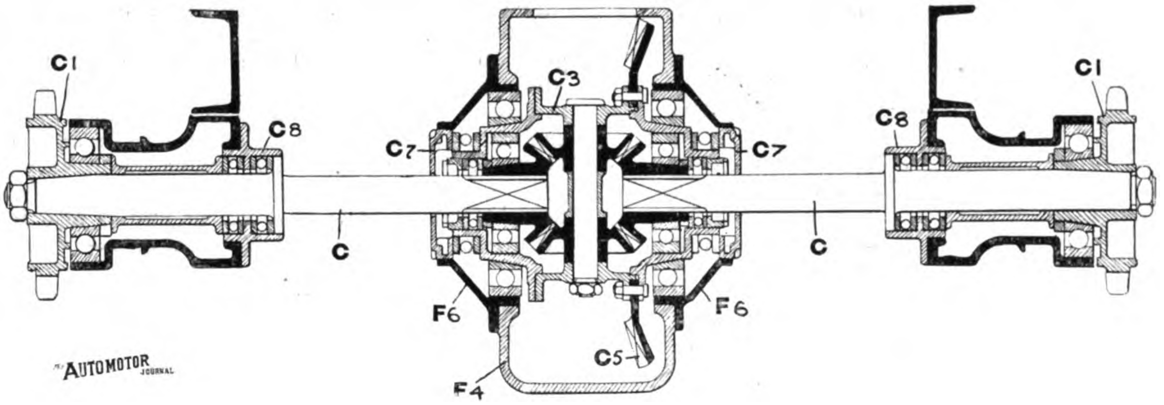


Fig. 10.—Vertical section through the Critchley-Norris differential countershaft, showing the arrangement by which each portion of the shaft can be removed without disturbing the differential-gear, or the differential can be dismantled without taking down the gear-box.

Referring more particularly to Fig. 10, it will be seen that the two portions, C, of the differential countershaft can at any time be withdrawn without disturbing any portion of the differential-gear, or in fact any part of the mechanism inside the gear-box. This is arranged for by giving the inner ends of these shafts a square cross-section, and making them fit accurately inside corresponding square holes in the bevels, C^2. Their outer ends, which are carried in brackets securely fixed to the side members of the frame, can also be rendered free to move outwards, for there is a collar, C^8, containing double ball-thrust-bearings, and this collar is made in two pieces so that it can be removed easily. When taken off, there is nothing to prevent the shaft, C, complete with its ball-bearings, from being drawn out at the side of the chassis, though of course the brake-drum, B (not shown in Fig. 10), and the sprockets, C^1, have to be loosened for this purpose.

We have already referred to the spring-drive device which is introduced inside the sprockets, C^1, between the sprocket wheels themselves and the countershaft. This device is not shown in our illustrations, but it consists of rubber blocks, fitted in cavities formed between the two members, and does not differ materially in general design from the spring-drive device that has for some time been fitted to the Lancashire Steam Wagon Company's lurries. It serves the usual purpose of preventing the vehicle from being started too suddenly, through any careless manipulation of the clutch, and allows the engine to make an appreciable start before the road wheels are necessarily compelled to revolve.

A "Live"-Axle Design.

Although the chassis with which we are now concerned is of the chain-driven type, yet the application of the Critchley-Norris differential-gear to a "live" axle is interesting. The design which they have prepared for this purpose is shown sectionally in Fig. 11, where it will be noticed that the road-wheels are mounted outside the stationary portion of the axle, and that the "live" shafts can be withdrawn without removing them.

Table of Reference Letters for the Critchley-Norris Illustrations.

A	Propeller-shaft.
A^1	Universal joint (front end).
A^2	Universal joint (rear end).
B	Countershaft brake-drums.
B^1	Operating levers.
B^2	Compensated rods.
B^3	Brake pedal.
B^4	Compensation lever.
B^5	Connecting link.
C	Differential countershaft.
C^1	Sprockets and "spring-drive."
C^2	Differenital "sun" wheels.
C^3	Shell of differential-gear.
C^4	Planet wheels
C^5	Bevel crown-wheel.
C^6	Adjustment collars for C^2.
C^7	Adjustment collars for C^3.
D	Hub-brakes.
D^1	Operating rods.
D^2	Brake lever.
E	Clutch pedal.
E^1	Actuating eccentrics.
E^2	Dash-pot.
E^3	Eccentric rods.
E^4	Engagement ring.
E^5	Leather-faced cone.
E^6	Clutch-spring.
E^7	Adjustment nut.
E^8	Clutch boss.
E^9	Thrust collar on crank-shaft.
F	Change-speed lever.
F^1	3rd and 4th gear rods.
F^2	1st and 2nd gear rods.
F^3	"Reverse" gear rod.
F^4	Main gear-box casting.
F^5	Front end-plate.
F^6	Side plates for differential.
F^7	Cover for operating-rods.
F^8	Cap for thrust-bearing on shaft, J.
F^9	Cap for thrust-bearing on shaft, K.
G	"Timing" and throttle-lever.
G^1	Outer tube of steering pillar.
G^2	Engaging collar.
G^3	Pivot for G^4.
G^4	Rocking lever.
G^5	Friction quadrant.
G^6	Travelling nut.
G^7	Pivot pin for "throttle" lever.
G^8	Rock-shaft for steering-arm.
G^9	Adjustable ball-thrusts.
H	Radiator.
I	Petrol tank.
J	First-motion shaft.
J^1	1st-speed-wheel.
J^2	2nd-speed wheel.
J^5	3rd-speed wheel.
J^4	4th-speed wheel.
J^5	"Reverse" wheel.
K	Second-motion-shaft.
K^1	1st-speed wheel.
K^2	2nd-speed wheel.
K^5	3rd-speed wheel.
K^4	4th-speed wheel.
K^5	Bevel-pinion.
L	Shaft for "reverse" pinions.
L^1	Intermediate pinions.

⊛ ⊛ ⊛ ⊛

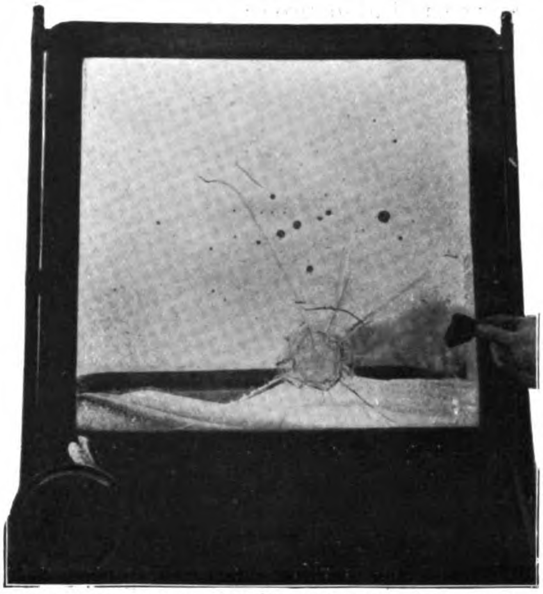
Pushing Pioneers.

The "Pioneer" 'buses of the London Power Omnibus Company, which hitherto have run only between Cricklewood and the Marble Arch, have now been extended to Charing Cross, and simultaneously a reduction in fares has been instituted.

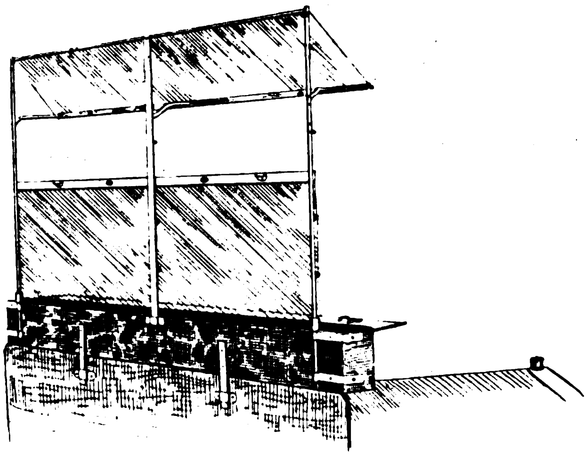
SEEN AT CORDINGLEY'S SHOW.

Wind Screens.

THERE were two new ideas in wind screens at the Show. One, called the "Pioven," is a celluloid device on the roller-blind principle. The screen consists of a thin sheet of celluloid, which is carried on a roller attached to the dash, and can be drawn up to any height required. A skeleton frame is, of course, also attached to the dash in order to fix the screen in position. Another feature of the fitting is a special rain shield, which forms a separate attachment. It consists of a narrow sheet of celluloid, which can be attached to the top of the frame, and when in place it stands out at an angle, so that it enables the driver to see under it. The other screen is at the same time partly let down, so that free vision is unobstructed. Ordinary shields, as all motorists know, are sometimes troublesome when they get wet from the rain, and it is to get over the difficulty of a wet surface that this device has been introduced.



AGRICULTURAL HALL SHOW.—The "Safety" wind shield, showing that a stone thrown at it did not penetrate or scatter the glass.

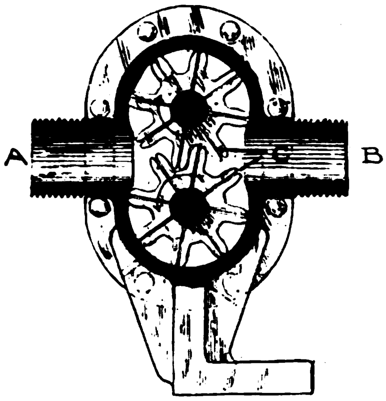


AGRICULTURAL HALL SHOW. — The Pioven wind shield with rain screen up.

The other screen, shown by the Safety Motor Screen Company, is a permanent fixture of the ordinary type. The transparent medium is partly glass and partly celluloid, there being one layer of the latter between two layers of the former. The object of this construction is to reduce the danger from accidental breakage. The layers are cemented together with Canadian balsam, which makes them a composite structure of considerable tenacity. A stone thrown on the screen breaks the glass on both sides, but the pieces do not fly, and it would be a very sharp instrument that would penetrate it. Some motorists may think this an unnecessary precaution, but it should at least appeal to those who have been victims of the stones which so many country urchins delight in throwing at passing cars. Unprotected celluloid tends to discolour, and is also inflammable—which explains the use of the glass.

Gear-Wheel Pumps.

This type of pump is becoming more and more popular among designers of cars, especially now that forced lubrication is coming into fashion. Among the largest manufacturers of these fittings are the Albany Engineering Company, and the special feature in the design of the pumps which they supply is the water seal.



AGRICULTURAL HALL SHOW.—The Albany Pump. Sketch showing the water seal, C, by which it is kept tight while working.

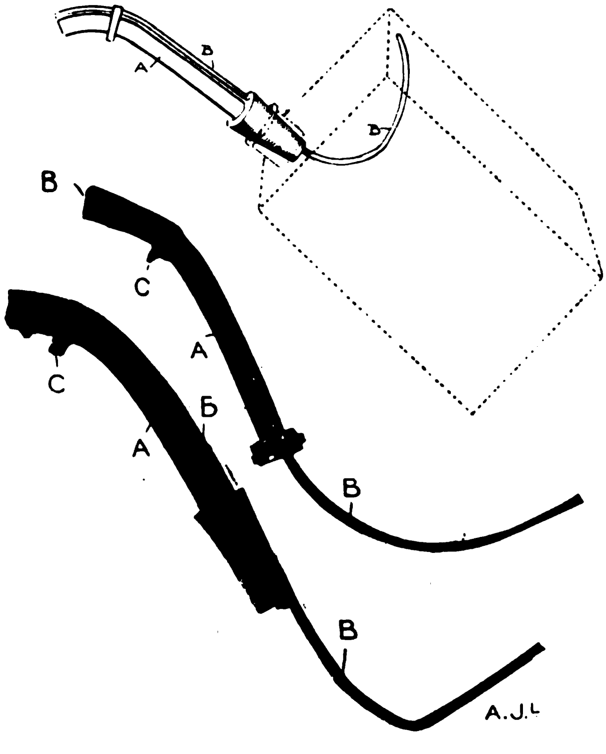
Up the face and along the edge of each tooth runs a groove; on an ordinary-sized pump it is less than $\frac{1}{16}$ of an inch wide and deep. This groove fills with water, and the water forms a kind of joint between the surface of the teeth and the barrel in which they revolve. It is therefore the groove which forms the water seal which is the special feature in these pumps. Our illustration shows the internal construction of such a pump. The water is sucked in at A—if the wheels revolve as indicated by the arrow—and is carried by the teeth of the wheels through the barrel of the pump, from which it is discharged at B. Water entering the pump has therefore to divide into two streams, half being carried by each gear wheel. A pump having a $\frac{3}{4}$-in. bore, suitable for use on average cars, can, we are told, deliver 500 gallons of water per hour, at 430 revs. per min., against a head of 100 ft.

Odourless Carbide.

Ordinary calcium carbide, as everyone knows, is not a pleasant substance on a car, if some of it happens to have been left exposed. A special treatment has been introduced, however, which removes the objectionable odour, and at the same time, it is stated, improves the quality of the carbide generally. The resultant substance, called the B.S.T. carbide, was shown for the first time by Millennium, Ltd.—the makers of the well-known puncture-proof solution. In appearance the B.S.T. carbide is almost black, and carries a faint odour of the petroleum with which it is initially treated. One of the properties claimed for this carbide is that it will not crumble up if exposed, nor will it continue to generate gas, even in the open air, after the water supply has been stopped. These properties are due to the treatment which closes up the pores of the raw carbide, and renders it far less spongy.

Safety Petrol Fillers.

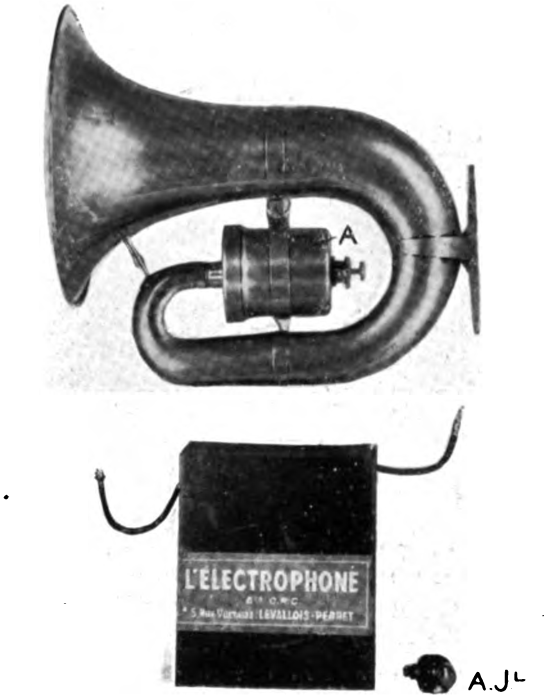
A very simple, but at the same time very useful, device has just been placed on the market by W. Pettett. It consists of a spout which can be temporarily attached to a petrol can, or any other vessel, in order to dispense with a funnel. Apart from this, however, the device renders overflowing impossible if properly used. Our illustrations show two forms of the device, one is specially constructed with a union for attaching to a standard petrol can, the other is fitted with a wooden bung for use with any ordinary can. Alongside the spout, A, is an air-tube, B, the inner end of which can be bent so that it reaches the "highest" point" inside the can. Its outer end projects slightly beyond the spout, so that if the end of the spout be placed at the level to which the vessel is to be filled (the stop, C, facilitates this), the liquid will close the air-tube, B, when it rises to that point, and thus stop the flow. Detachable gauze filters are fitted on the end of the spout, so that a funnel is not even necessary on this account.



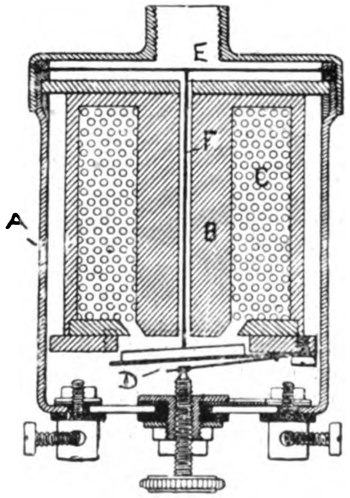
AGRICULTURAL HALL SHOW.—**Pettett's Safety Petrol Fillers. The line Sketch shows the application of Pettett's Filler to a petrol can.**

The "Electrophone."

This name has now been given to a new automobile horn introduced by Gauthier and Co. It is worked by electricity and controlled by a little switch constructed on the principle of a bell-push. An intermittent or continuous blast can be obtained, the note which it sounds being somewhat striking, after that of an ordinary reed-horn. Our illustration shows the complete outfit, which simply consists of the horn with its electrophone attachment, A, a switch, and a battery of four dry cells. The electrophone attachment is on the principle of a telephone receiver; Fig. 2 shows its construction. On closing the switch, current passes through the coil, C, magnetises the core, B, attracts the armature, D, and so breaks contact at the trembler. This part of the mechanism

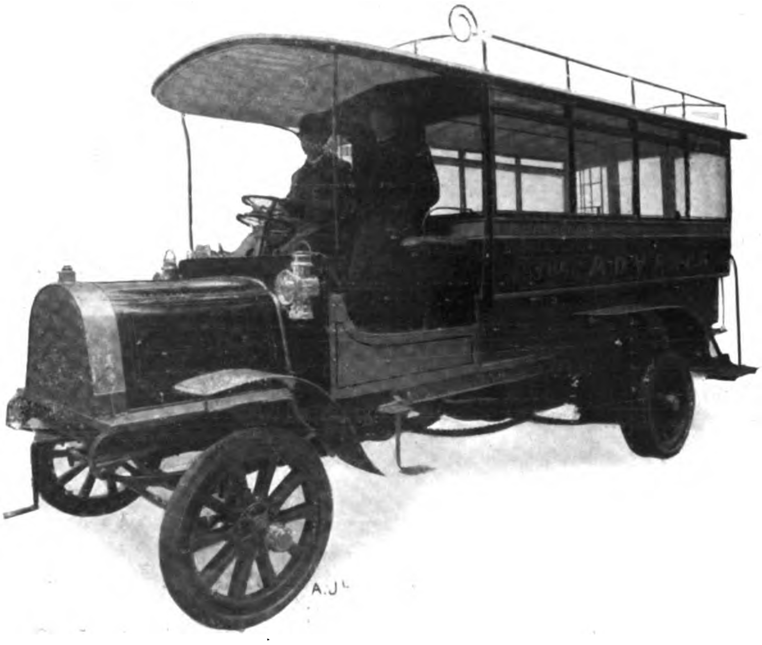


AGRICULTURAL HALL SHOW.—**The "Electrophone."**

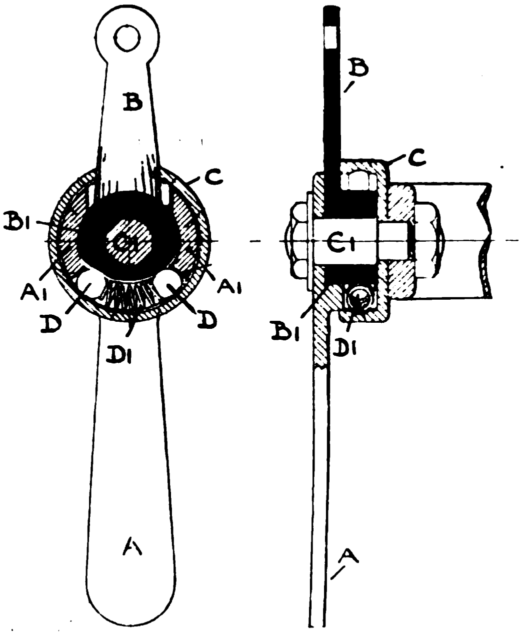


AGRICULTURAL HALL SHOW.—**Section through the coil of the "Electrophone."**

therefore, is nothing but a trembler coil on a small scale, and so long as the switch is closed so long will the armature, D, "buzz" to and fro. Attached to the armature, D, is a spindle, F, which actuates a diaphragm, E, in unison with the trembler. This diaphragm sets up vibrations in the surrounding air, and these vibrations are magnified by the trumpet, thus producing a very audible sound. The note depends, of course, on the rapidity of the vibrations, and, therefore, on the adjustment of the trembler.



AGRICULTURAL HALL SHOW.—A Dougill 'Bus which has the well-known Frick gear.



AGRICULTURAL HALL SHOW.— The "Autoloc."

The "Frick" Gear.

Messrs. Dougills, who are the well-known makers of the "Frick" gradually variable speed gear, have now made a 'bus fitted with this device for the Bromley and District Motor Omnibus service. It is probably the only public service vehicle which has either a gradually variable gear or a friction drive, and its performance will be watched with interest. We understand that the firm have 'buses of the same design on order for other companies, but that at present they will not be seen in London. The vehicle is fitted with a 3-cylinder engine, 5½ ins. by 6 ins. bore and stroke, which develops 30 h.p. at 800 revs. per min. After passing through the disc-friction-gear the drive is taken by one chain to a countershaft, and by another chain to the axle, two chains being necessary on account of the great length between centres.

The "Autoloc."

This device is one of Mr. Hamilton's ingenious patents, and is made by the Finchley Motor and Engineering Company. It is designed to take the place of the ordinary ratchet quadrant, by which levers are held in definite positions, but it possesses the advantages of greater compactness, and of automatic and universal action. It will hold a lever rigidly in any position throughout its range without the use of any trigger, and at the same time the hand-lever is always free and can be moved in either direction.

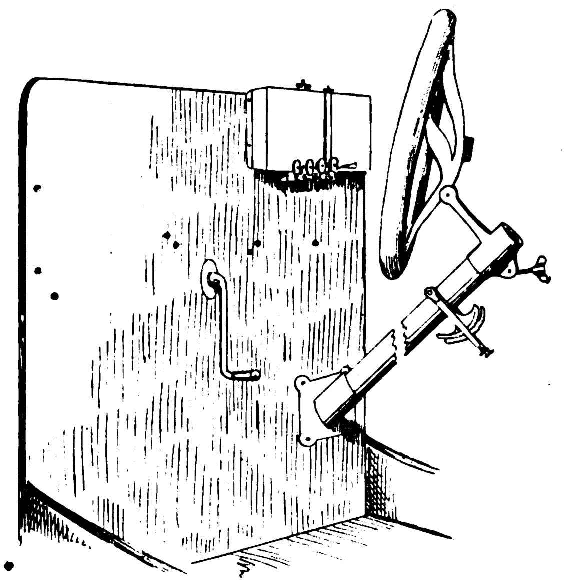
The principle of its action is well illustrated by the sectional drawing. One of its important points is that the hand-lever, A, is not in one piece with the operating-lever, B, on the other side of the fulcrum, C^1. On the inner end of the lever, B, is a cam-shaped boss, B^1. Partly surrounding this boss are two jaws, A^1, which are solid with the lever, A. Between these jaws at one end passes the lever, B, but two hardened steel balls, D, and the helical spring, D^1, are placed between their other faces. These balls are held apart by the spring, D^1, and lie on the flat part of the cam, B^1, thus wedging that member rigidly to the steel case, C, which encloses the whole "mechanism." Owing to this lock which the balls, D, afford, any force applied to the outer end of the lever, B, would have to burst the steel case, C, before it could move the lever. On the other hand the lever, A, is able to move the lever, B, without the least trouble, because there is just sufficient clearance between the jaws, A^1, and the lever, B, to enable the other ends of the jaws to release the balls from their wedged position before the two levers engage with one another, and begin to move in unison. As the two levers rock about their common fulcrum they carry the balls with them, and these instantly lock the lever, B, directly the pressure on A is released.

A New Metal.

Under the name of "Clarbun Bronze" Messrs. Clark, Bunnett and Company have placed a new metal on the market, for which they claim many advantages. It is, we learn, a comparatively "pure" alloy, with few fancy elements in its composition. It forms a metal of very close grain and high specific gravity. When machined it finishes with a perfectly smooth surface, and is remarkably free from the soft spots which are at times difficult to eliminate from some mixtures. One of its most important features is that it is also an antifriction metal, and as such has been tried by Mr. Partridge, the chief engineer of the London Electric Supply Corporation, who has, we learn, found it a satisfactory substitute for white metal, and possessed of much better wearing qualities. An interesting exhibit on their stall was a pair of pump-rings, taken from a high-service pump used by the Sutton District Water Company. These rings had been in use for 1,632 hours, and appeared to be very little worn, although they had replaced similar rings of gunmetal, which only lasted 1,158 hours.

A Novel Arrangement.

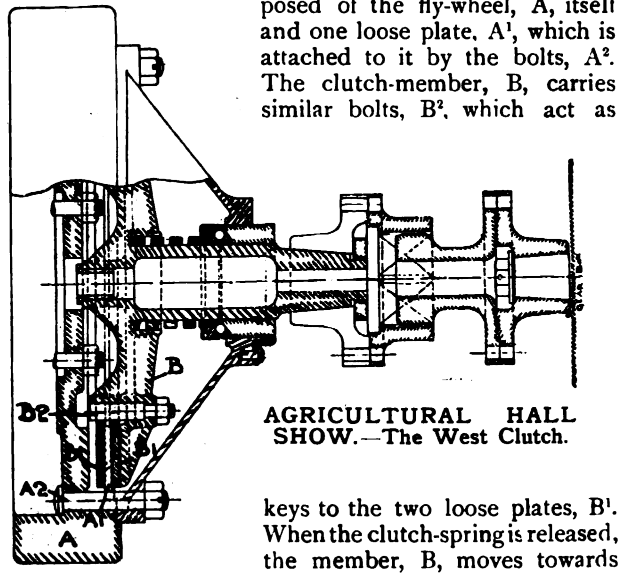
On the new "British" car, the starting-handle is placed on the dash, so that the engine can be set in motion without moving from the seat. The steering-wheel is hinged, too, in order to allow the driver greater freedom to perform the operation of turning the handle.



AGRICULTURAL HALL SHOW.—Starting handle and hinged steering-wheel on the "British" car.

The West Clutch.

The new West cars are fitted with plate-clutches, of which we give a sectional drawing. There are two pairs of plates, but those on the fly-wheel member are composed of the fly-wheel, A, itself and one loose plate, A¹, which is attached to it by the bolts, A². The clutch-member, B, carries similar bolts, B², which act as keys to the two loose plates, B¹. When the clutch-spring is released, the member, B, moves towards the fly-wheel and forces the loose plates against one another, thereby squeezing out the oil which covers their surfaces, and allowing them to gradually take up the drive.



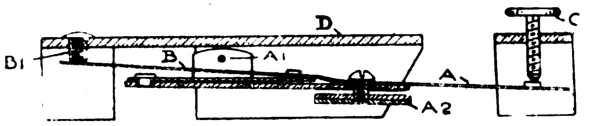
AGRICULTURAL HALL SHOW.—The West Clutch.

Smith's Speedometer.

Messrs. S. Smith and Son have brought out a very neat attachment for their well-known and popular speed-indicator. Motorists who have one of these instruments on their car can now procure a fitting, combining watch, aneroid and compass, which can be fastened directly to the case of the speed-indicator. In the converted instrument the speed-indicator dial is in the centre, the watch and aneroid are on either side. Above is the compass, which is mounted in gimbals, and has a small button by which it can be thrown into a horizontal position.

Marconi Coils.

The name of the famous perfecter of wireless telegraphy is sufficiently magnetic to draw attention to anything bearing it. Marconi's Wireless Telegraph Company are now placing ignition-coils on the market, and among their features is a new trembler, of which we give a drawing. It consists of a partially-balanced blade, A, pivoted at A¹, which carries a loose soft-iron plug or armature, A². At the other end is the fine flat spring, B, which rests against the screw, B¹, and the contact is broken at the screw, C. The screw, B¹, is merely a shop adjustment for tuning the coil, but the screw, C, is, of course, under the control of the user. The return wire is soldered direct to the blade, A, in order to avoid passing the current through the small loose contacts at B¹ and A¹. Enclosing the trembler is a metal case, D.



AGRICULTURAL HALL SHOW.—Trembler of the Marconi Coils.

A Welcome Haven of Rest.

In concluding our report of the Show, we would take this opportunity of marking our appreciation of Mr. Cordingley's courtesy in placing the "club" room at the disposal of the Press. Comparatively few of the casual visitors to the Hall were aware of the existence of this apartment, in which many of the social and business meetings of the week were held. It is probably the most luxurious room which has hitherto been especially provided for similar functions, and Messrs. Cordingley, who are, of course, responsible for the conversion—for the room is not normally dissimilar to the remainder of the Hall—are to be congratulated on their initiative, which met with such wide-spread appreciation.

* * * *

A Secretary Wanted.

The Aero Club are desirous of appointing a new Secretary, who should have experience not only of secretarial but club work, and the opportunity should be one of promise to a man of initiative, as the growing popularity of aeronautics throughout the world renders the present a particularly opportune moment for the extension of the work of the Aero Club. A small salary, we understand, is attached to the post, and it would not be necessary for the whole of the secretary's time at present to be devoted to the work of the club. Applications should be sent to the Chairman of the Aero Club, 110, Piccadilly.

The AUTOMOTOR JOURNAL BUYERS' GUIDE TO THE COMMERCIAL VEHICLES OF 1906.—SUPPLEMENTAL TABLE.

(The full table appeared in THE AUTOMOTOR JOURNAL of March 24th.)

LEADING CHARACTERISTICS.								CONSTRUCTIONAL DETAILS.																
						PRICE.		ENGINE.					TRANSMISSION.			WHEELS, TYRES, AND DIMENSIONS.								
																					DRIVING TYRES.		WEIGHT.	
Description.	Load.	Capacity (cu. ft.) or seats.	Platform Area.	Drive.	Axle.	Chassis.	Complete with Standard Body.	Type.	Number of Cyls.	Bore.	Stroke.	Normal Speed.	Clutch.	Change Speed.	Number of Speeds.	Wheels.	Wheel Base.	Track.	Overall Length.	Extreme Width.	Type.	Size.	Chassis.	Complete.
h.p.	cwt.		sq. ft.			£	£			ins.	ins.						ft. in.	ft. in.	ft. in.	ft. in.			cwt.	cwt.
25-30 Austin ...	60	34	—	CC	*sa*	*700*	—	V	4	4½	5	900	*ml*	S	4	W	9 9	4 7	18 6	7 0	R	40 × 4*t*	50	—
16 Albion Lurry or Van ...	40	—	50	CC	*sa*	*450*	490	V	2	4⅞	5	950	*lc*	U	3	W	10 0	4 7	16 0	5 7	R	34 × 4*t*	26	33
27 Westinghouse 'Bus ...	—	34	—	CC	*sa*	—	—	V	4	—	—	700	*md*	S	4	W	13 0	5 10	—	—	R	*t*	60	—
30-33 Prunel 'Bus ...	—	34	—	CC	*sa*	—	—	V	4	110	130	1000	—	S	3	W	—	—	—	—	R	—	—	—
24-30 Jackson 'Bus ...	—	34	—	CC	*sa*	—	—	V	4	110	120	750	*lc*	S	3	W	12 6	5 6	19 0	6 6	R	36 × 3*t*	—	—
40 Turgan 'Bus ...	—	34	—	CC	*sa*	—	—	V	4	120	150	800	*lc*	S	4	S	—	—	—	—	S	—	—	—
12 Turgan Van ...	—	—	—	CC	*sa*	—	—	—	2	110	130	800	*lc*	S	—	S	—	—	—	—	R	—	—	—
16 Albion Lurry or Van ...	24	—	45	CC	*sa*	*395*	430	V	2	4⅞	5	950	*lc*	U	3	W	9 3	4 6	15 0	5 6	R	34 × 5	21	27
16 Albion Lurry or Van ...	20	—	35	CC	*sa*	*370*	395	V	2	4⅞	5	950	*lc*	U	3	W	8 5	4 6	13 0	5 6	R	34 × 5	20	24
16 Albion Lurry or Van ...	15	30	30	CC	*sa*	*340*	365	V	2	4⅞	5	950	*lc*	U	3	W	7 0	4 6	12 0	5 6	R	34 × 4	19	23

						PRICE.		ENGINE.					BOILER.							DRIVING TYRES.		WEIGHT.	
Description.	Load.	Capacity (cu. ft.) or seats.	Platform Area.	Drive.	Fuel.	Chassis.	Complete with Standard Body.	Type.	Simple or Compound.	Number of Cyls.	Bore.	Stroke.	Type.	Heating Surface.	Wheels.	Wheel Base.	Track.	Overall Length.	Extreme Width.	Type.	Size.	Chassis.	Complete.
Steam Vehicles.																							
	tons		sq. ft.			£	£				ins.	ins.		sq. ft.		ft. in.	ft. in.	ft. in.	ft. in.			tons	tons
Foden Lurry ...	5	—	—	CC	*co*	—	550	H	C	2	4 and 6	7	*loco.*	—	S	—	—	—	6 6	S	42 × 10	—	—
Stewart Lurry ...	6	—	81	G	*co*	—	550	H	C	2	4½ and 7	7	*loco.*	—	W	11 6	5 8	21 0	6 6	S	39 × 10½	—	4½
Garrett Lurry...	5	—	—	CC	*co*	—	—	H	C	2	5 and 7	—	*fire*	—	S	10 6	—	19 6	6 4	S	42 × 10	—	5
Hindley Lurry ...	5	—	80-90	G	*co*	—	—	H	C	2	4¼ and 7	6	*loco.*	—	S, W	10 0	—	—	—	S	—	—	—
Hindley Lurry ...	3	—	60	G	*co*	—	—	V	C	2	3½ and 6	5	*loco.*	—	S. W	8 0	—	—	—	S	—	—	—
Gorton Lurry...	5	—	86	CC	*co*	—	—	H	S	2	3¾	5	*fire*	95	S	—	—	—	—	S	39 × 9	—	—
Allchin Lurry ...	5	—	73	CC	*co*	—	—	H	C	2	4¼ and 7½	6	*loco.*	86	S	—	—	—	—	S	42 × 10	—	—
Wallis Wagon ...	5	—	—	C	—	—	—	H	C	2	4¾ and 8¾	9	*loco.*	—	S	—	—	—	—	S	42 × 10½	—	—
Steam Tractors.																							
Garrett Tractor ...	6	—	—	G	*co*	—	420	H	S	1	5¼	9	*loco.*	—	S	7 4½	4 0	13 8	4 6	S	48 × 8	—	3¾
Wallis Tractor ...	5	—	—	—	—	—	—	H	C	2	4¾ and 8¾	9	*loco.*	—	S	—	—	—	—	S	—	—	—
Wellington Tractor ...	5	—	—	G	*co*	—	—	H	C	2	4½ and 8	9	*loco.*	—	S	—	—	—	—	S	54 × 8	—	—

Leading Characteristics—
Drive.—S = Shaft ; CC = Side Chains ; C = Single Chain ; G = Gear ; R = Ratchet.
Live-Axle.—*la* = Live-axle ; *sa* = Stationary-axle.
Fuel.—*Co* = Coal or Coke ; *Pa* = Paraffin.

Engine—
Type.—H = Horizontal ; V = Vertical.
Simple or Compound.—C = Compound ; S = Simple.

Boiler—
Type.—*Loco* = Locomotive type ; *Fire* = Fire-tube type ; *Water* = Water-tube type.

Transmission—
Clutch.—*lc* = Leather Faced Cone ; *mc* = Metal Cone ; *md* = Multiple Disc ; *sd* = Single Disc ; *ex* = Expanding.
Change Speed Gear.—S = Sliding Spur ; U = Unusual.

Wheels—
W = Wood ; S = Steel.

Tyres—
S = Steel ; R = Solid Rubber ; P = Pneumatic ; W = Wood ; *t* = twin tyres.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

GUARANTEES AND ENGINE RATING.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As an electrical engineer I find the discussion with regard to the rating of automobile engines very interesting but scarcely practical, since what the buyer of a car wants to know is not merely what horse-power an engine will generate when running on a test bench at a predetermined speed, but what it will do when running on a car.

The actual horse-power required to tow a car at the legal limit of speed on the level is only a fraction of the power that the engine is rated at, the extra power provided being required for rapid acceleration and to enable the car to surmount heavy gradients under unfavourable conditions. On gradients the engine slows down and only develops a portion of its rated output, so that the full power is only developed at very high car speeds, when it is required to overcome the resistance due to increased windage.

With these premises it seems absurd to endeavour to classify motors according to the cubical contents of the working space in their cylinders and the revolutions per minute of their crankshafts, unless the clearance space above the top of the pistons and the length of stroke are also taken into consideration, since the mean effective pressure on the piston, and therefore the horse-power per stroke, depends largely on the quantity of the heated gases behind the piston and not only on the initial pressure generated by the explosion.

To show the futility of quoting the cubical contents of the cylinders as a basis of comparison for automobile engines without considering other points of design I may mention that I have before me details of a recent test of a Crossley internal combustion engine having one cylinder 11 ins. diameter, 21 ins. stroke = say 1854 cubic inches. On the lines of Mr. Weigel's arguments this should be a better engine than the Napier which has only 300 cubic inches, but when I say that this cylinder capacity only develops 42 b.h.p. when working at a piston speed of 672 ft. per minute with a mean effective pressure of 95 lbs. per square inch and that the weight of the engine is 3¼ tons, I think that most of your readers, including Mr. Weigel, would prefer to have even the Napier motor on their cars.

Mr. Weigel's remark anent the calorific value of petrol and the capacity of a British manufacturer to get more out of it than a foreign can, would lead one to suppose that the last word has been said regarding the construction of internal combustion engines, whereas I believe that the thermo-dynamic efficiency of the best engines still remains somewhere in the neighbourhood of 30 per cent., leaving plenty of scope for improvement.

With modern methods of balancing cranks and forced lubrication for bearings, the old objections to quick revolution engines on the score of vibration and excessive wear disappear, the only difficulty that remains being that of lubricating the cylinder walls at high piston speeds. With regard to this, I only have to say that on the figures given by Mr. Maudslay, the piston speed of the Napier motor when the car is travelling at 48 m.p.h. is within the limits laid down for marine engines that have to work at full power for weeks without a stop, year in year out, so that even with the limited skill possessed by the everyday mechanician, a well-made and well-designed engine should much more than outlast a three years' guarantee.

I am of opinion that what the buyer wants to know is not the horse-power of the engine but what a car will do on the road with standard gearing, and instead of determining the horse-power of an engine by a brake test I would suggest that complete chassis loaded to an amount equal to the weight of the body and passengers be run on a smooth graded track, the first portion of which should be level, to allow full speed to be got up, and terminating in a gradient sufficient to stop any powered car. Times could be recorded electrically as the car passed points a few yards apart and from the speed curve so obtained and the known weight of the car the effective horse-power at the road wheels could be calculated.

To obtain uniformity of results it would be necessary to have a covered track, and if such could be constructed and run by an independent body like the Society of Motor Manufacturers, I venture to think that the results of the tests would bear a good deal of weight with the people most concerned.

I am Sir,
Yours faithfully,
WM. HODGKINSON.

Danvers Street, S.W., March 27th.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am in agreement with all those gentlemen who have entered into the spirit of discussion seriously and properly; but they have misread their letters. If they will refer back to Mr. Lambert's letter, they will distinctly find that he suggests that stroke, *per se*, is the *sole* factor that constitutes the cubical contents of a cylinder. Either that gentleman did not know what he was writing about, which I infer from the tone of the letter, or he wrote in such a style that no one (and I beg of these gentlemen to read it again), can infer otherwise than that he suggests that stroke, and nothing else, is the one and only factor that affects cubical capacity.

I corrected him by saying "The cubical contents are measured by the area of what it contains," implying thereby that the area of the cylinder was as equally necessary as the stroke.

If Mr. Evans will refer back again to my letter, he will find that in correcting Mr. Lambert, I refer to a cylinder, and not in particular to the method of measuring an engine cylinder. I think, therefore, that Mr. Evans, when he re-reads my letter, will appreciate that we are in agreement.

I am obliged to all these gentlemen for their tuition in the simple rules of mensuration; but if they will refer back to lists of my figures given in THE AUTOMOTOR JOURNAL of March 10th, they will find that all these figures are in all and every case correct for the *swept-out cubical inch contents of every engine I include and denominate in that list.* They will find that in that list I gave the bore and stroke upon which I based my calculations. I fancy these gentlemen have not followed the whole correspondence, or they would have found that both my figures and my knowledge are not at fault, and they would have inferred by the fact that my figures were correct and that I was acquainted with the simple rule which they are good enough to advise me of. If they will refer back, I feel sure that I can rely upon their courtesy in stating in your next issue that my figures are in order.

It is regrettable that a misunderstanding of this description should have occurred, owing to letters of the type written by Mr. Lambert being permitted in such serious discussions, as this style of buffoonery is calculated to cause unnecessary misunderstanding and correspondence, and for this reason I shall take no notice of his absurd letter published in your last issue.

Mr. Earp states he has calculated my figures and found them correct, and, unfortunately, both Mr. Earp and the other gentleman have simply fallen foul of me because I condescended to answer a piece of folly.

All the points raised by these gentlemen are in order, and we have always agreed.

Replying to Mr. Carter, I also agree, but would point out (as I have already done to Mr. Maudslay) that I raised the objection that Mr. Edge should invite others to do as he was doing, inasmuch as he was in a position to afford it and others were not. I feel sure that all and every one of my *confrères* in the motor industry would be happy to give Mr. Carter a three years' guarantee for the sum of £600.

Lastly, replying to Mr. Johnson, he seems to misconstrue my letter. In the first place, I object to his raising the question of quality, as I have only taken into comparison cars of the highest reputation, and have in fairness to all placed them upon an equality. If Mr. Johnson, of S. F. Edge, Limited, desires to challenge it, I shall be pleased to name the firms from whom the material (of most excellent quality) is purchased for the construction of Napier cars, and I beg to inform him that the same excellent material is used in other British cars costing under £400 a chassis. In fact, you may take it that nearly all cars at the present moment are made of equally good material, and therefore such a point cannot be raised.

Mr. Johnson shows an utter lack of calculating power, or he would find that the price of the Winton car he names is about the average per b.h.p. of the other cars I mentioned, viz.:—

Calculated on the same unit, 355 cubical inch contents is equal to £14 approximately per b.h.p.; in fact, it is only £1 cheaper than the Fiat.

The same applies to all the other firms he names. Their cars average about the same as the others I have mentioned, and it is only the particular car that Mr. Johnson is interested in that is priced in comparison so high, and the reason I take it (as Mr. Johnson asks me) is possibly in payment of the three years' guarantee.

Mr. Johnson is incorrect when he says I admit that the 40-h.p. Napier is more than 30-h.p. What I said was this, "I am merely taking their basis of unit, which naturally is absurd, for it would be impossible to obtain 48 b.h.p. from 300 cubical inch contents."

It is regrettable that I have to repeat to Mr. Johnson words which in themselves are perfectly plain.

Now as Mr. Johnson is of the firm of Messrs. S. F. Edge, Limited, it should be easy for him to take up the challenge I issued to Mr. Edge in a contemporary journal to the effect that I would pay all expenses and have the engine tested at Faraday House, and which challenge has not been accepted.

I will now make it more interesting to Mr. Johnson. I will undertake to purchase from him a 6-cylinder Napier (4 in. × 4 in.) for the full catalogue price, plus £100 commission for himself, subject to a Faraday House test that it will take a load of 40 h.p. for two hours.

Finally, I would thank the editor of the THE AUTOMOTOR JOURNAL for the very kind way in which he has placed so much space at the disposal of myself and other gentlemen.

Yours faithfully,
D. M. WEIGEL.

March 30.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With regard to the Napier three years' guarantee, which is at present agitating the minds of not a few of the automobile world, I should like to draw Mr. Weigel's attention to one little matter that seems to have escaped his notice. In his efforts to show that Mr. Edge's Napier cars are as dear with his guarantee as some of the foreign cars are without such guarantee, the logical inference is that the price of the foreign-made cars will not allow their makers to guarantee them, because they know that the repairs ultimately will cost as much as the initial price for one of Mr. Edge's cars. In other words, he is endeavouring to set off the increased initial cost of the Napier against the probable increased cost of repairs of a lower type car.

It seems to me that if a man can buy a really first-class article like the Napier car is admitted to be, and obtain a three years' guarantee with it, that he then knows exactly what he has to pay for, but if he buys one of the so-called cheaper foreign-made cars with a smaller initial outlay, but a very uncertain repair bill in front of him, not only is he unwise to take the risk, but silly to think of it for one moment, as in addition to having a car, the very makers of which fear to give a guarantee with, with the continual possibility of costly repairs, but also the fact that his car must, on account of this presumably increased liability to derangement, be more often out of commission. This is a perfectly logical inference, and the one that should suggest itself to the man who is buying the car, who is after all more important than all the makers put together.

Mr. Weigel seems to look at the matter from a motor manufacturer's point of view. I can tell him the car owner does not agree with his crying down of a 3-year guarantee. If of no value, why does not someone offer a 10 years' guarantee?

Yours faithfully,
H. M. JOHNSTON.

March 31st.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—All readers of your excellent Journal will be indebted to you for publishing Mr. Weigel's letters on this subject, for it is seldom a writer provides so much excellent reading.

I thought, in my innocence, that the first gem, viz., that cubical contents are measured by area would be hard to beat, but in his last letter Mr. Weigel has really surpassed himself. He now speaks of an engine carrying a load of 40 h p. Who was it that spoke of a microscope of a million horse-power? Good as Mr. Weigel's joke is, I am afraid, in this instance, he has been cribbing. The next precious jewel is, I am quite sure, original, for Mr. Weigel's genius alone could discover that the horse-power of an engine depends on the gear that is used with it. Mr. Weigel will, no doubt, shortly tell us that the unfortunate Napier cars must be wrong because they weigh only 4 ft. 7 in.

Faithfully yours,
W. N.

April 2nd.

P.S.—I am really glad that Mr. Weigel has discovered that horse-power depends on the gear used, as this principle must of necessity lead on to perpetual motion, which will enormously reduce the running cost of motor cars.

[We have also received letters on the same subject from Messrs. T. Crespin Harrison, W. E. Harcourt, and Hubert C. Clark, but none of these gentlemen appears to raise any material points beyond those which have already been dealt with by previous correspondents. Mr. Harrison, for instance, has apparently experienced no difficulty in following Mr. Weigel's statements and figures concerning cylinder capacity, whereas both Mr. Harcourt and Mr. Clark join issue with the numerous correspondents who have evidently taken too literally Mr. Weigel's method of expressing himself in his previous letters. There is obviously nothing to be gained by emphasising misinterpretations which could hardly have been intended, and are on the face of them absurd, even if they were apparently suggested, and we consequently think that further references to cylinder dimensions and ordinary mathematics are not really necessary in this controversy. We do not, for example, suppose—especially in view of his letter in the present issue—that Mr. Weigel intended to give the impression that "wall area" and "cubic contents" are identical, or that the total pressure on a piston depends rather on the cubic capacity of the cylinder than on the superficial area of the piston-head, and yet even such quaint ideas as these have been suggested by some of Mr. Weigel's statements.—ED.]

BRITISH OUTPUT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I notice a letter from Messrs. West, Limited, in your last issue, from which it appears that I have done this firm an injustice by not giving them credit for such a large output as they have.

I think your correspondents have overlooked the fact that I have been challenged by some firms for stating that the total output of British factories was so large. I therefore set out clearly how I arrived at my figures, and I am pleased to notice that Messrs. West, Limited, enable me to add some thousands of turnover for January to the figures which I published. It is very pleasing to me to read a letter from your correspondents so different in tone to those who wished to make out that the British industry was much smaller than my estimated figures, but I note now, with Messrs. West's help, my figures should be considerably larger than those which I set out.

Referring to the letter from the Rex Motor Company in the same issue, in which they appear to take some exception to my British manufacturing figures which have recently been published, they appear to quite overlook the fact that my figures as originally given were challenged and stated to be too high. I therefore showed in tabulated form the way I had arrived at those figures, and I am exceedingly obliged to the Rex Company for stating that their figures should be much greater than my original estimate. It would have been better, I think, for them to have stated this when my figures were attacked, but I am pleased to notice that even now at this late date they are helping me to add to the figures which I originally gave, and I therefore note that in their opinion my figures were too small and should be added very considerably to by the Rex Company's output.

Thanking your correspondents for their assistance to have justice done to the British manufacturing industry.

Yours truly,
S. F. EDGE.

March 30th.

* * * *

PUBLICATIONS RECEIVED.

Bradshaw's Canals and Navigable Rivers of England and Wales. By Hy. R. de Salis, A.M.I.C.E. London: Hy. Blacklock & Co., Ltd., 59, Fleet Street, E.C. Price 21*s.* net.

Tring and District. The Rose and Crown Hotel, Tring.

Handbook on the Albion Car. The Albion Motor Car Company, Limited, Scotstoun, Glasgow.

Catalogues.

Daimler Parts. (T.H. 35.) The Daimler Motor Company (1904), Limited, Coventry.

Climax Motors, 1906. Climax Motors, Limited, Coventry.

"*Castle*" *Accumulators, &c.,* 1906. United Motor Industries, Limited, 45-46, Poland Street, W.

Spyker Cars. The British Automobile Commercial Syndicate, Limited, 97 and 98, Long Acre, W.C.

* * * *

Gaiters for Air Tubes.

MOTORISTS who have found themselves in the awkward predicament of having no spare cover wherewith to replace a badly-cut tyre, will appreciate the initiative of the Palmer Tyre Company in putting a gaiter on the market which is designed to overcome this difficulty. It is intended to be applied directly to the inner tube, so that it strengthens the tube just where it passes over the weak spot in the cover. These gaiters are constructed of the well-known Palmer cord fabric, and protect some twelve inches of the tube. Thus protected, the tyre can, it is stated, be run for 200 to 300 miles, if necessary, before the cover is removed for repair. There is no need to solution the protectors, the air-pressure within the tyre holding them in position; consequently the same protector can be used as often as necessary.

RACES, RECORDS, AND TRIALS.

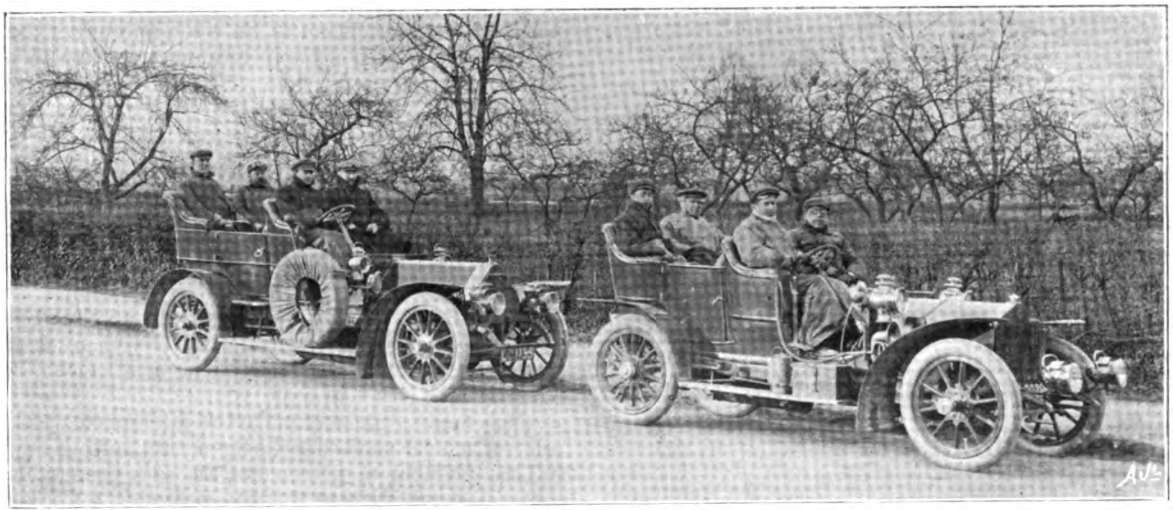
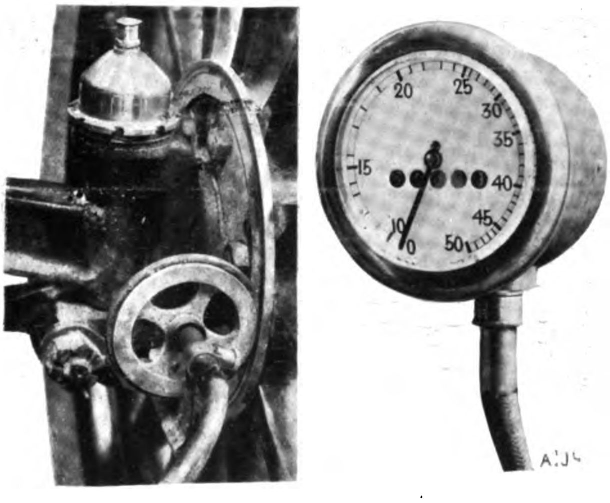


Photo by Argent Archer.

A.C.G.B.I. TYRE, SPEEDOMETER AND LAMP TRIALS.—On the 29th day. At Colnbrook. The Rolls-Royce Car, and some of the Judges' Committee on the Iris Car.

A.C.G.B.I. Tyre, Lamp, and Speedometer Trials.—Conclusion.

THESE trials were brought to a close on Saturday, March 31st. The Dennis Car—of which we gave a photograph in our issue of March 10th—however, finished its trial on the previous Thursday, having made non-stop runs each day of the week, and having accomplished a record "non-stop" run under official supervision of 4,000 miles. This record exceeds by 782 miles that of any previous competitor. The following is the week's record for the various entries :—



A.C.G.B.I. SPEEDOMETER TRIALS.—The Kirby Speed Indicator with its driving gear.

Collier Tyres.—36 in., one puncture; 34 in., one puncture, changed one cover and tube on account of a cut; 815 mm., cut in off side rear cover; repair subsequently blew out.

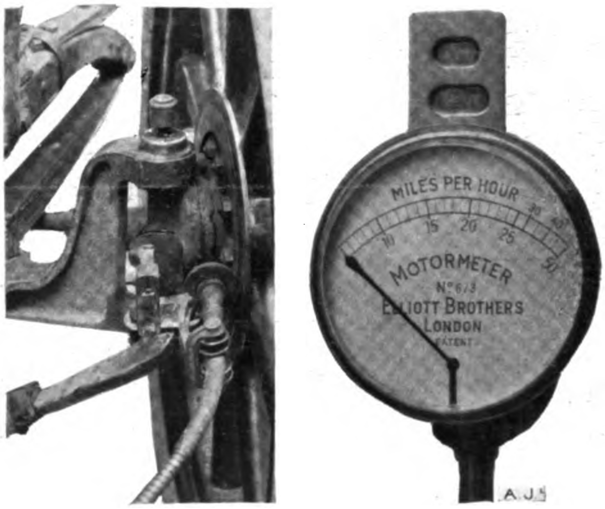
Speedometers.—Staunton. Two non-stop runs; broke flexible shaft. Did not record during one day. Cowey.—Three non-stop runs. Broke flexible shaft. Kirby.—Five non-stop runs; finished on Friday. Elliott.—Six non-stop runs.

Lamps.

Worsnop Headlights.—Rear side bracket gave trouble, and lamp had to be removed. Otherwise burnt well.

Tail Lamps.—Ryta and Hoult, burnt well. Metallic Mirrors, burnt well.

The following preliminary report of the complete trial has been issued by the club :—



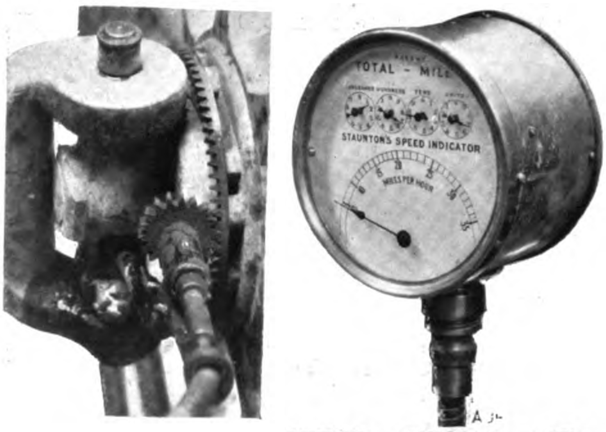
A.C.G.B.I. SPEEDOMETER TRIALS.—The Elliott Speed Indicator with its driving gear.

The road tests began on March 1st, and amounted to 25 days' running. In brief, the performances over the whole trial are as follows :—

20-h.p. Dennis Car: Non-stop throughout, except on first day, when petrol filter choked at 85½ miles.

Collier Tyres: 36-in., made non-stops on 22 days; 34-in., made non-stops on 22 days; 815 mm. made non-stops on 23 days.

Lamps: Tail-lamps, Ryta and Hoult burnt well throughout; went out only five times during entire run, due on two occasions to lack of attention to wick. Metallic Mirrors, burnt well throughout; went out only six times, on one occasion due to jolt from back spring of car breaking. Worsnop Headlights have been unfortunate in suffering from obstruction of the pipes and damage to burner,



A.C.G.B.I. SPEEDOMETER TRIALS. — The Staunton Speed Indicator with its driving gear.

otherwise they have burned well. The speedometers were tested over 2,000 miles, one batch running the first half of the trial and the remainder the second. The Vulcan was removed for alteration of the bracket, but had non-stops throughout. The Warner lost only five minutes for adjustment of the driving-gear, and once the flexible-shaft broke, otherwise non-stops throughout. The Kirby and Cowey Recorders made non-stops throughout, except that each once broke its flexible shaft. The Staunton made non-stops all through, except for breaking its flexible shaft on the 27th, and not recording on the 28th. The Elliott, Jones, Gratze, and Cowey Indicator made non-stops every day.

Scottish Reliability Trials.

THE following entries have already been made. These are arranged in the order of entry, which is the order of start from Glasgow on June 13th. Entries at ordinary fees close on May 2nd :—

	Name.	Car.
1	Albion Motor Car Co., Ltd....	24-h.p. Albion Tonneau.
2	Albion Motor Car Co., Ltd....	16-h.p. Albion Tonneau.
3	Claud Hamilton, Ltd. ...	Gladiator.
4	John Hunter	12–15-h.p. New Arrol-Johnston.
5	New Arrol-Johnston Car Co., Ltd.	12-h.p. Arrol-Johnston Dogcart.
6	John S. Napier	18-h.p. Arrol-Johnston.
7	Wm. Beardmore	24–30-h.p. New Arrol-Johnston.
8	Thos. Shaw	25-h.p. Siddeley.
9	Gladiator Co.	24–32-h.p. Gladiator.
10	Thos. Chas. Pullinger ...	16–20-h.p. Beeston Humber.
11	Kennedy Motor Co., Ltd. ...	15-h.p. Darracq.
12	Ed. Powell	10–12-h.p. Coventry Humber.
13	Sunbeam Motor Car Co., Ltd.	16–20-h.p. Sunbeam.
14	Western Motor Co.	10–12-h.p. Argyll.
15	W. M. Wallace	12–14-h.p. Argyll.
16	Argyll Motors, Ltd.	14–16-h.p Argyll.
17	Western Motor Co.	16–20-h.p. Argyll.
18	Rennie and Prosser, Ltd. ...	15-h.p. Siddeley.
19	T. Masui	14–22-h.p. " Germain."
20	Buchanan Shiell	20–30-h.p. Maudslay Phæton.
21	R. L. Jefferson	Rover.
22	J. K. Starley	Rover.
23	C. S. Rolls and Co.	20-h.p. Rolls-Royce.
24	C. S. Rolls and Co.	30-h.p. Rolls-Royce.
25	Swift Motor Co., Ltd. ...	9–10-h.p. Swift.

Frome's Hill Climb.

PARTICULARS of the rules governing this competition, being organised under the auspices of the Herefordshire A.C., for May 24th, are to hand. As a result of the competition rules, which have recently been issued, of the A.C.G.B.I., under which this competition will be held, the special regulations are delightfully short, and, therefore, readily absorbed by competitors. A special notice prefaces the rules, in which it is intimated that any competitor against whom a charge of furious driving, in the Herefordshire district, shall have been proved, will be disqualified from winning a medal or receiving a certificate. Steam cars, as we stated recently, are not eligible to enter, and no petrol car exceeding 35 h p. will be allowed to take part. The competition is an open one under the rules of the A.C.G.B.I. Each entrant must provide one observer, who will not ride on the car of his nominator. The entrance fee in the open handicap is £1 1*s*., and in the Club handicap, 7*s*. 6*d*., entries closing May 19th. Weighing of cars takes place at Newmarket Street on May 24th. The start is at 10.30 a.m.

The distance to be covered (from the upper gate-post of gate on right side of Frome's Hill, starting from Ledbury and Bromyard main road, to cyclists' danger board at top) is 1,289 yards, and will be timed from a standing start to a flying finish. The total rise is 344·61 feet, the average gradient 1 in 11·22, at the steepest part it is 1 in 6·37.

Each competitor may make two attempts to ascend the hill. Each car shall carry its regulation touring body and full complement of passengers, *i.e.*, four passengers with tonneau or two without tonneau, seated in a fair manner.

The handicap will be determined on the following formula :—

$$\frac{\text{Time in seconds} \times \text{horse power.}}{\text{Total weight in lbs.}}$$

The lowest deduction to be the winner.

The horse-power of each car will be ascertained as follows :—

$$\frac{\text{Cylinder diameter in inches}^2 \times \text{number of cylinders.}}{3}$$

There will be gold, silver and bronze medals in the open handicap, and a certificate will be awarded to each competitor whose car successfully climbs the hill.

MILES PER HOUR
5
10
15
20
25
30
35
40
45
50
THE COWEY PATENT RECORDING SPEED INDICATOR
No B4
KEW GARDENS
YARDS BACK
PAST SPEEDS IN MILES PER HOUR

A.C.G.B.I. SPEEDOMETER TRIALS.—The Cowey Speed Indicator.

The French Grand Prix.

Entries are coming in slowly for this race on the Sarthe Circuit. Amongst the latest received are three Lorraine-Dietrich cars, to be driven respectively by Gabriel, Rougier, and Duray.

French Industrial Vehicle Trial.

It has been decided to organise a contest in France for commercial motor vehicles from June 7th to 13th, in connection with the Tourcoing Exhibition.

Resilient Wheel Competition.

Entries for this competition—organised by *L'Auto*—of which we gave particulars in our issue of February 10th, 1906, are now published. There are thirteen entries, as follows:—

Class I. (Cat. I.).—1. Yberty et Merigon (16-h.p. Decauville); 2. Ducasble (14-h.p. De Dion); 3. Le Securitas (16-h.p. Luc-Court); 4. Amelot (Martin-Lethimonnier).

Class II. (Cat. I.).—1. Hallé (35-h.p. Gobron-Brillié); 2. Soleil (20–30-h.p. Renault); 3. Spherola; 4. Cadignan (16-h.p. Boyer).

(Cat. II.).—Hallé (24–40-h.p. Rapid); 2. Cosset (30-h.p. G.V.R.); 3. E.L. (Edmond-Levi) (24–30.h.p. Dietrich); 4. Garchey (24.h.p. De Dion).

Extra Class.—Monnin-Damidot.

The trial takes place between the 17th and 26th of April, and, as already announced, the route lies from Paris through Lyons and Marseilles to Nice and return, a distance of over 2,200 kiloms.

A Reliability Contest at Palermo.

Commencing on March 24th, a number of competitors have been disputing the honour for first place in a series of "reliability" tests for the Panormitan Cup. The tests consisted of a brake trial, a hill climb, fuel consumption, and a speed trial. This latter was somewhat novel, as it was run off on a rectangular course of 4·34 kiloms., the leading times for this distance being: 1. Florio (120-h.p. Mercedes), 3m. 16s.; 2. Cortese (90-h.p. Mercedes), 3m. 25s.; 3. Baldoni (24-h.p. Fiat), 4m. 6s.; 4. Rigal (50-h.p. Itala), 4m. 15s.; 5. Ravetta (60-h.p. Mercedes), 4m. 18s.; 6. Cammarata (24-h.p. Itala), 4m. 35s.

In all 15 cars competed, a 9-h.p. Florentia being timed for 9m. 45s. As a result of the entire series of tests a 22-h.p. Berliet car, driven by Ribolla, has been adjudged the first prize and the special Cup. Rigal secures second place with his 50-h.p. Itala; Lose (14–20-h.p. Renault) third prize; Balotoni (24-h.p. Fiat) fourth prize; and Ravetta (60-h.p. Mercedes) fifth prize.

MOTOR BOATING.

Monaco Motor Boat Meeting.

The damage, *en route* to Monaco, to the two Napier boats, Siola and Yarrow-Napier, was duly recorded in The Automotor Journal last week. Work has been actively in progress since in the endeavour to render both craft fit to take part in the important races which commence next week, and in the case of Siola, we understand, there is every possibility of her being ready to start in good time. In our picture on this page Siola is shown being conveyed into the Exhibition at Monaco. She was actually the first boat to arrive at the Exhibition, where there are now 66 boats on view.

Motor Yacht Club Reliability Trial.

Permission has been obtained from the Harbour Board for these trials to take place in Southampton Water, probably the last week in July. No. 4 Dock, the same which was used for the purpose last year, has been again secured for the competing boats.

British Motor Boat Club Race Meetings.

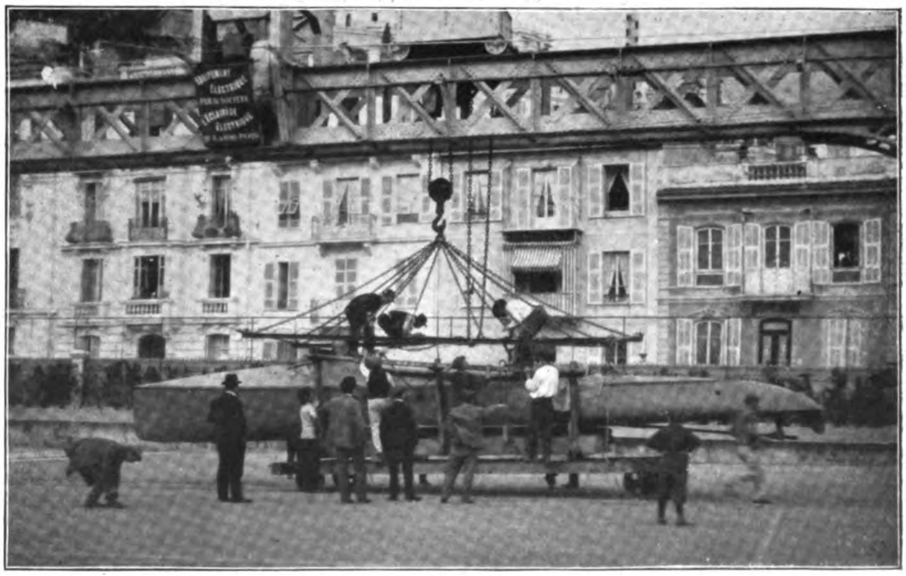
Particulars of the programme of races for 1906 are to hand. The opening meeting on May 5th will take the form of a cruise down and up the river, the Commodore, Admiral Sir W. Kennedy, in command.

Oulton Broad Races are fixed for June 5th, and will include a race for boats not exceeding 30 ft. over all (1st Prize, Brooke Trophy), a handicap for motor boats from 18 ft. to 40 ft. over all, a handicap for motor boats not exceeding 18 ft. over all, and four gymkhana events.

The races at Liverpool on June 8th and 9th comprise races and handicaps for boats not exceeding 40 ft., and 30 ft. for motor cruisers, dinghies, &c. On the second day there will be a Flying Mile Race for the B.M.B.C. Cup.

A cruise and race from London to Cowes, about 200 knots, is down for July 7th, to start at 11.45 a.m. In this run there will be a class for *bona fide* sea-going cruisers, exceeding 25 ft. over all, fitted with internal combustion engines.

A prize of £30 will be given to the first vessel in. A Challenge Cup and Gold Medal will be given to the first vessel winning on time allowance under the M.M.A.



MONACO MOTOR BOAT MEETING.—"Siola," the British built Napier boat, being conveyed into place in the Monaco Exhibition.

rating and time scale; a prize of £20 to the second vessel, and £10 to the third vessel on time allowance. A bronze medal will be given for each vessel completing the course within 48 hours. A gold medal will be given to the fastest vessel using exclusively heavy oil, and which completes the course within 40 hours. Entrance fee £10.

Cowes Race Meeting on August 6th and 7th will include a race for boats exceeding 25 ft., and not exceeding 40 ft. over all, built or owned in either England or France. 1st prize, "Entente Cordiale" Challenge Cup and Medal. Races for boats exceeding 250 and not exceeding 1,000 rating, for boats not exceeding 250, a handicap for *bona fide* cruisers, &c., &c.

The Ryde races on August 14th will be for boats exceeding 250 rating, and a handicap for boats not exceeding 250 rating.

At Burnham-on-Crouch, the closing meet of the season, on September 13th, 14th, and 15th, there will be in a lengthy programme events for motor boats not exceeding 40 ft. over all, for motor boats from 25 ft. to 35 ft., and a race for motor boats not exceeding 25 ft. In each of these three events the 1st prize will be A. J. Wilson Challenge Cup and Gold Medal. On the last day there will be the Flying Mile Championship for the B.M.B.C. Gold Medal.

CLUBS AND ASSOCIATIONS.

Aero Club.

THE annual general meeting of the Aero Club was held at the Agricultural Hall on Thursday of last week, the principal business being the election of the new committee for the ensuing year, which was constituted as follows:—

The Right Hon. Lord Howard de Walden, Rear-Admiral Sir Charles Campbell, K.C.M.G., &c.; Major-Gen. Sir H. E. Colville, K.C.M.G., C.B.; the Hon. C. S. Rolls, Col. J. E. Capper, C.B., R.E.; Roger Wallace, K.C. (present chairman of the club); Prof. A. K. Huntingdon, Dr. F. W. H. Hutchinson, Capt. Corbet, Messrs. J. Lyons Sampson, Frank H. Butler, Martin Dale, Griffith Brewer, Ernest Bucknall, Stanley Spooner, F. Harold Sully, G. F. Sharp, J. T. C. Moore-Brabazon.

The council of the club for 1906 remains practically as before, *i.e.*, Field-Marshal Earl Roberts, V.C.; Lord Suffield, P.C.; Lord Howard de Walden, Lord Kinnaird, F.R.G.S.; Lord Llangattock, J.P.; Lord Montagu of Beaulieu, Admiral the Hon. Sir Edmund Fremantle, G.C.B.; Admiral Sir Edward Seymour, G.C.B.; Rear Admiral Sir Charles Campbell, K.C.M.G.; General Sir Reginald Hart, K.C.B.; Major-General Sir H. E. Colville, K.C.M.G.; Sir David Salomons, Bart., F.R.A.S.; Prof. Sir William Crookes, F.R.S.; Sir Norman Lockyer, K.C.B.; Sir Hiram Maxim, Count Henry de la Vaulx (vice-president Aero Club de France), the Right Hon. Earl Dundonald, Senhor Santos Dumont, H.S.H. Prince Blucher of Wahlstadt, His Grace the Duke of Sutherland, K.G.; the Right Hon. Lord de Clifford, the Hon. Arthur Stanley, M.P.; and the members of the club committee (*ex-officio*).

No less than 51 new members have been elected to the Aero Club since the beginning of the year.

Automobile Association.

DURING the Cordingley Motor Exhibition week, the Association enrolled sixty-six new members.

Automobile Mutual Protection Association.

THE Earl of Shrewsbury and Talbot, the President of the Association, occupied the chair at the annual general meeting, which was held at the Agricultural Hall, last week. The report for the year ending December 31st, which was submitted and approved, stated that there are now 104 members of the Association, and that the available funds show an increase of £132 over that of last year.

Hull A.C.

DR. W. H. COATES, the Chairman, presided at the annual meeting of the club held last week at the Imperial Hotel. The report, as read by the hon. secretary, Mr. Bergh Hancock, was a record of successful work for the past year. The balance sheet, presented by Mr. A. E. Hagestadt, the hon. treasurer, being of an equally satisfactory character. Mr. W. H. Harrison-Broadley, M.P., was re-elected president; Sir Seymour King, M.P., K.C.I.E., Mr. Guy Wilson, Mr. A. J. Atkinson, and Dr. W. H. Coates were elected vice-presidents; whilst Dr. W. H. Coates (chairman), Mr. G. H. Strong (vice-chairman), the hon. secretary, the hon. treasurer, and Mr. W. C. Dawson (the hon. solicitor), were re-elected.

The formation of a separate section of the club for motor cycles was agreed to, Mr. H. Whiteley being elected secretary and Mr. G. Mumby captain.

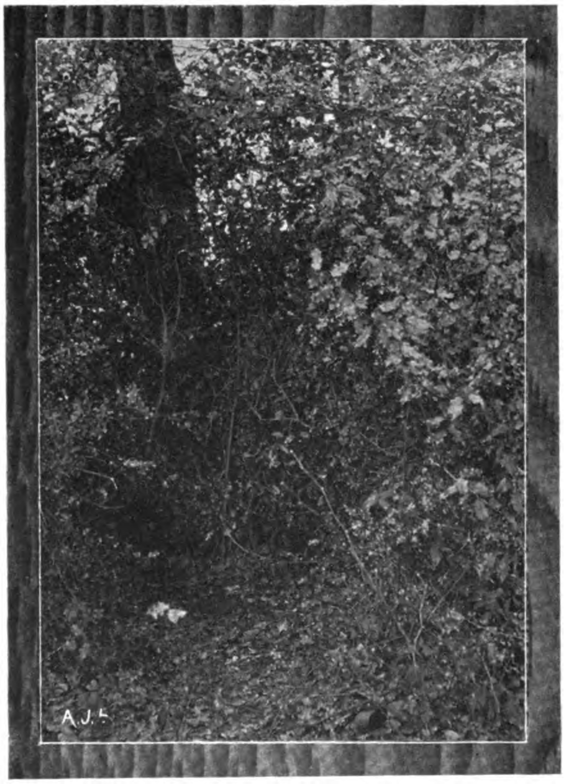
Manchester A.C.

NOTWITHSTANDING the boisterous weather, with intermittent snow, the first run of this season of the Manchester A.C., last week end, was well attended, between 70 and 80 members and friends sitting down to afternoon tea at the Brine Baths Hotel, Nantwich.

Motor Union.

A LARGE number of the members gathered at the Agricultural Hall on Wednesday of last week, when the annual general meeting of the Union took place. The Hon. Arthur Stanley, M.P., the chairman, who presided, dealt with the work of the Union in a very interesting and lucid manner.

He pointed out that the report summarised the whole work of the Union very fully and very clearly. It showed an increase in the number of members, which now stood at 11,265, of 4,010 in the year. The number of clubs and organisations affiliated to the Union



One of the "Umbrageous Thickets" on the Ripley Road.—This is one of the nice little sylvan retreats which the Surrey police have constructed as hiding places from which to spy upon and entrap motor cars. As may be seen, the policeman has arranged a kind of bank underneath the tree to stand upon, where he is completely ensconced in the foliage and peeping from behind its trunk to the road, which is on the other side of it, would be invisible to the most eagle-eyed passer by. This sylvan retreat is situated several hundred yards on the Ripley side of Wisley Hut. We have to thank Colonel W. J. Bosworth, the Chairman of the Automobile Association, for the photograph, the description of the trap having been furnished by the Association's scouts.

had increased by 24 in the year, the total being 64 this year as compared with 40 last.

The chairman drew attention to the many matters of great interest in the report, and touched upon one or two which he thought required special mention. In respect to the legal and legislative work, which aimed at providing legal advice and assistance to all the members of the Motor Union throughout the United Kingdom, some important steps had been taken. Solicitors in various country towns had been appointed, nearly 100 such local solicitors now being on the list of official representatives.

In dealing with the speed limit inquiries, it was difficult, he thought, to overrate the good work which had been done by the Union. In many cases where applications by local bodies were intended to be brought, the Union had used its educational influences on the local authorities, and had shown that it was inadvisable in the interests of the public to proceed with the application, the result being that in many cases the local authorities had even gone as far as to withdraw their notices.

When the Royal Commission to inquire into the Motor Car Act was appointed, a joint committee of the Automobile Club and the Motor Union, he said, was formed, the secretary of this committee being Mr. Rees Jeffreys, the Motor Union secretary. He thought that both the members of the committee and the members of the Union were very much indebted to Mr. Rees Jeffreys for the immense industry which he had shown in collecting evidence, and for the way in which that evidence was placed before the Commission.

The Defence Fund was in a healthy condition, and it was satisfactory to mention that this was started at the suggestion of Lord Onslow, a vice-president of the Union, who also paid into the fund the first subscription.

In connection with the training of drivers, the Union had been very prominent in taking up this matter at the early stages, and he was glad to say that the Union and the Automobile Club were now going to work together in this matter, in order to see that, so far as could be arranged, only properly skilled drivers should be allowed on the roads.

In regard to the dust question, they were co-operating with the Roads Improvement Association, and carrying out experiments in two or three places in conjunction with that association, in order to see if they could not obtain some perfectly dustless material for the construction of roads, which would minimise the nuisance, if not entirely remove it.

He expressed the highest appreciation of the work of the local clubs in assisting in popularising the movement, and in helping towards the preparation of the important evidence which was laid before the Royal Commission.

The difficult task of coming to a workable agreement with the A.C.G.B.I., so that in the future no friction between the two bodies would arise, had, he was glad to say, been successfully accomplished. Broadly speaking, the lines upon which the two bodies would work were as follows:—The Automobile Club undertook all foreign relations and all the technical side of the movement, and the Motor Union undertook the organisation in the country and the provinces, and all the legislative and legal work. He was glad to say that even the short time it had been working it had proved that it was likely to act very well, and put an end to all friction in the future.

He was inclined to be of the opinion that, in regard to future legislation, it was a good thing that there would for the present be no alteration in the existing law. This was due to the fact that the Government, he thought, had got quite enough on their hands this year without touching motor car legislation. Time was on the side of the motorist, and he thought that, as the motor car became more known, it would become more and more popular.

Referring to the driving certificates which were being issued by the Automobile Club, he did not think that the club was in any way aiming to allocate to itself, or trying to achieve a power simply to be used for its own ends. The whole aim and object of this driving certificate was the protection, he thought, of the employers, and, he believed, of the drivers themselves. It was strongly urged, he understood, upon the Royal Commission that the Government should undertake the examinations and the issuing of certificates. They put their case equally strongly that they should do nothing of the sort, because the examination and the granting of certificates in foreign countries by the respective Governments was, he believed, universally found to be of no value whatever. The reason was very probably this—if the Government granted a certificate, they granted it for proficiency in driving; it was practically impossible for them to take it away unless the man had ceased to be proficient in driving. A man who had once been proficient would always be able to say that he had retained his old proficiency, but, on the other hand, the club certificate was not only one of proficiency in driving, but to a great extent a certificate of character.

Now, with the Automobile Club, if the man was a skilful driver, but he was found to be unsuitable in any other way, such as drunkenness, &c., it would then be for the club to say that although the man was a skilful driver they would not let him hold their certificate, and he thought that was the only way that they would be able to put down the bad cases of inconsiderate driving.

Before concluding, the chairman expressed very hearty thanks on behalf of the Union to the various committees for the splendid work done by them during the past year. It was difficult for anybody outside those committees to realise the extent of work which they involved. His final word, he said, would be one of very hearty appreciation and cordial thanks to their energetic secretary, Mr. Rees Jeffreys.

Mr. Langridge, in seconding the report, mentioned as a point of considerable importance to the Union, the question of provincial meetings. The Union had in many ways to thank the local clubs for the way in which they had backed them up during the year.

Mr. J. E. Hodgkin, the Secretary of the North-Eastern Automobile Association, made some suggestions in reference to the question of speed limit applications. He advocated that steps should be taken to prevent these applications being made, by appointing observers in every one of the local clubs' districts, within scope of the respective clubs' operations. These observers could see members of the councils, and discuss the matter with them to this end. Another good thing he thought that should be done and which was done by the N.E.A.A. was the appointment of Members of Parliament of their respective districts as honorary members of local clubs. He thought also the time would come when the various secretaries of the automobile clubs throughout the country would have to come into closer touch. Although Mr. Rees Jeffreys was a wonderful organiser, and his work beyond praise, he thought even his energy could not touch *all* the difficulties which local organisations had to face. There were many points which could only be thrashed out by a conference.

Dr. Hopkins Walters also supported the passing of the Report, which was adopted unanimously.

The chairman then formally moved the passing of the accounts and balance sheet, and put the position before the meeting briefly as follows: "We are £1,661 better off this year than we were last year."

Colonel Holden seconded the motion, which, like the report, was passed with acclamation, a vote of thanks to the chairman concluding the meeting.

The following distinguished motorists were elected vice-presidents of the Motor Union last week:—Sir George Newnes, Bart., M.P., Mr. Rufus D. Isaacs, K.C., M.P., Mr. J. Muir Astbury, K.C., M.P., Colonel H. C. L. Holden, R.A., F.R.S., Captain J. A. Cole, J.P., Mr. W. Birtwistle, J.P., Dr. Hopkins Walters, and Mr. T. W. Grace. Sir George Livesey, Sir Francis Burdett, Bart., Alec Ogilvie, Esq., R. H. Hunter Weston, Esq. (New Zealand), and T. L. Poyd, Esq., were elected life members.

Motor Van, Wagon, and Omnibus Users' Association.

THE title of the Motor Van and Wagon Users' Association will, in future, be the Motor Van, Wagon and Omnibus Users' Association. This alteration has been found necessary in view of the fact that all the principal companies operating motor 'buses have joined the Association. The chairman of the Association is Colonel R. E. Crompton, C.B., M.I.C.E., and the following committee have been elected for the ensuing year:—J. F. Baxendale (Pickford's, Limited), W. Worby Beaumont, M.I.C.E. (hon. engineer to Automobile Club), Arthur J. Clay (Bass, Ratcliffe and Gretton, Limited), F. C. A. Coventry (Great Western Railway), William Dalziel (The West of Scotland Carrying Company, Limited), James L. Farmiloe (T. and W. Farmiloe, Limited), Colonel H. C. L. Holden, R.A., F.R.S., M.I.E.E., H. Howard Humphreys, M.I.M.E., W. Rees Jeffreys, W. G. Lobjoit (W. and J. Lobjoit and Company), H. Thomson Lyon, M.I.E.E. (chairman, Traffic Committee, Westminster City Council), Douglas Mackenzie, A.M.I.M.E., C. C. Mitchell (The London Road Car Company, Limited), L. G. Oldfield (London Omnibus Owners' Federation), Arthur Paterson (Carter Paterson and Company), R. R. Robbins (Wild and Robbins), E. Shrapnell Smith, A. A. Campbell Swinton (The London and District Motor 'Bus Company), the Hon. Arthur Stanley, M.P. (chairman, Motor Union), W. H. Willcox (W. H. Willcox and Company, Limited) and Dr. Hele Shaw.

North-Eastern Automobile Association.

THE Committee of the Association announce that they have made arrangements for the use of a small office for the convenience of hon. secretaries of the various districts, who may have any clerical work to do, and also for the general use of members desiring information on motor or touring topics. The office is on the second floor in the Sun Buildings, Collingwood Street, Newcastle-on-Tyne, and will be open to members of the Association between the hours of 9 a.m. and 5 p.m, for five days in the week, and from 9 a.m. to 12 noon on Saturdays. A large scale map of the counties of Northumberland and Durham is kept at this office, and, together with a large amount of other information, will be at the disposal of members.

Society of Motor Manufacturers and Traders.

At the first meeting of the new council of the Society of Motor Manufacturers and Traders, held last week, Mr. Sidney Straker was re-elected president (his third period of office), and Messrs. S. F. Edge and E. M. C. Instone, vice-presidents. The following were elected as the Committee of Management for the ensuing year:—Messrs. Charles Sangster, G. A. Burls, T. Clarkson, Claude Johnson, H. Austin, F. Coleman, E. Gascoine, H. G. Burford, and C. Jarrott.

Amongst other matters considered, was the position in reference to the Renault patent, and the vexed question of trade discounts and commissions.

The first meeting of the new Carriage Builders' section of the society has been called, and the society has convened a special meeting of those interested in motor cabs, in order to discuss the new draft regulations proposed by the police.

The Marine Motor section have held a meeting, when the decision of the society with reference to the Marine Exhibition was discussed, and it was resolved to give their utmost support to the April, 1907, Exhibition. The same committee also had under consideration the question of reliability trials, and a sub-committee was appointed to go further into the regulations.

Yorkshire A.C.

The Yorkshire Automobile Club has arranged further free garage for its members at the following garages:—Hull City Garage, North Street, Hull: T. Smurthwaite, Romanby Road, Northallerton; E. A. Colby, Trinity Yard, Dewsbury; Edgar Smith, Weymouth Street, Halifax. The Club is desirous of appointing further free garages, and the hon. sec., Mr. C. P. Wilson, Town Hall Chambers, Leeds, will be glad to hear from any garage owner willing to extend this privilege to members of the Club.

The police in the vicinity of Leeds are becoming active, three traps were noticed on Saturday last by the chairman of the Club (Mr. E. H. Hepper), who motored from Leeds to Harrogate for the purpose of acquainting himself with all the streets that the Corporation is desirous of placing a speed limit upon. Mr. Hepper is to give evidence on behalf of the Club at the Local Government Board enquiry.

The main traps are at Moortown and Spacey Houses, on the Leeds and Harrogate road. The Moortown trap extends from Moortown Church (an officer being stationed in the churchyard) to the cross roads some 200 yards away. The Spacey Houses trap is some two miles from Harrogate, and extends from the top of the hill just beyond the Spacey Houses Hotel to the foot of Humphrey Bank.

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AERONAUTICS.

In the Aero Club's Section.

Among the attractions at the recent Exhibition at the Agricultural Hall must be reckoned the Aero Club's exhibit of a variety of models and appliances connected with ballooning and aeronautics of a highly instructive kind. The principal exhibitors in the ballooning section included Messrs. Gaudron and Messrs. Short Brothers, while private balloons which had been built to order were lent for exhibition purposes by the Hon. C. S. Rolls and Mr. Frank Butler. This department of the Exhibition was especially strong in a variety of cars for use with balloons. The actual navigable and aeroplane section was unfortunately represented by models only, but of these there was no lack, and special attention was bestowed upon the model of the Wright aeroplane made and exhibited by Mr. A. V. Roe. Captain Jones, as on former occasions, had his model airship, as also Mons. Beixler, while a model of the Stringfellow machine, as made by the late Mr. Stringfellow, was on view. The Frost-Hutchinson experimental feathered flapping-wing machine, of which a descriptive article appeared in The Automotor Journal on May 27th last year, was represented by a number of photographs. In fact, the illustration department was particularly strong, and included a number of balloon photographs, and a variety of valuable and interesting old prints connected with ballooning.

A Drag Hunt Per Balloon.

Mr. Frank Butler, Mr. Moore Brabazon, Captain Corbett and the Hon. C. S. Rolls ascended from the Wandsworth Gas Works last Saturday afternoon in the Aero Club balloon, and came to earth again near Henfield, under the Sussex Downs, near the point where they are broken through by the River Adur. During their journey, which took place in very calm weather, the aeronauts practically took part in a drag hunt, at any rate an event of this kind was in progress close below them, and they were enabled to follow it for a considerable distance. There was a large field of some 60 horsemen, and as they, of course, looked perfect pigmies from the height of the balloon, the effect of these little miniatures jumping the hedges was amusing in the extreme. The weather was so calm that, on their descent near Henfield, the aeronauts were able to entertain some of the villagers by attaching a long rope to the balloon and allowing them to ascend to a height of 200 feet in it.

So greatly has the hill-climbing power of the modern automobile increased, that there is quite a demand amongst car owners for hills that will really test their vehicle. One decidedly good test-hill is Gardner Street, Glasgow, a thoroughfare with a continuous gradient of 1 in 6, which would at one time have been looked upon as unclimbable by any automobile. Our photograph, however, shows a Delaunay-Belleville car surmounting it with perfect ease, while an almost equally remarkable feat was performed previously by the same car, which took a freight of 14 passengers up Balmano Brae.

THE FIELD OF THE ELECTRIC TRAMWAY AND MOTOR 'BUS.

By E. Manville.*

THE phenomenal development of the motor 'bus within the metropolitan area has produced such a burst of enthusiasm in the promoters of this system of traction that I fear an inflated view is now being taken of the merits of the motor 'bus as against the older and well-tried system of the propulsion of tramcars by electricity.

Being myself interested in the development of electric tramway systems largely, having acted as consulting engineer to authorities who have constructed not a few of these, and being, as is well known, equally interested in the commercial adaptation of the internal combustion petrol motor, I think the time has arrived when an impartial and judicial investigation of the relative merits of these two forms of public conveyances, and of the fields which may be allotted to each, would be of advantage.

I could have wished that it were possible to carry out this intention to the full, but so much has been said—and, I fear, in an exaggerated style—as to the merits of the motor omnibus, that, in order to properly ventilate the question, I have no option but to criticise these various statements, and thereby appear to place myself on the side of electric tramways, in the endeavour to indicate the relative positions which should be occupied by each to the other. I shall, however, endeavour to do this in the fairest possible manner.

In order that a fair comparison may be made, it is essential, in the first place, to realise those conditions which are of primary importance in dealing with the problem of the transportation of large numbers of the public in crowded centres.

There are two such main considerations:—

(1) What system will provide the travelling public with the best and cheapest facilities for reaching their destinations with the least discomfort and inconvenience to the non-travelling public? and

(2) What system, whilst embodying the first requirement, is the most profitable to the promoters of the undertaking?

Dealing with the first of these two considerations, it is exactly here that the advocates of the motor 'bus have aroused the controversy between it and the electric tramway.

In my opinion, the relative advantages and disadvantages of these two methods of traction may be summarised as follows:—

Motor Omnibuses.

Advantages.

(1) Probably greater speed from point to point, owing to their being free to move about the roads, avoiding other traffic *en route*.

(2) Ability to vary the service from one road to another, thus enabling the most profitable routes to be ascertained without loss of capital.

(3) Ability to draw up by the pavement, so as to facilitate passengers entering or alighting, without proceeding to the middle of the road.

(4) The absence of any rails in the roadway.

(5) Where the roads are exceptionally narrow, non-interference with other vehicles desiring to stop by the pavement.

Disadvantages.

(1) High cost of operation.

(2) Great noise and corresponding inconvenience to other users of the road and residents.

(3) Smell, and the prevalence of the smoke of burnt lubricating oil.

(4) The ever-present danger of side-slip; (5) the danger of fire; (6) vibration; (7) danger to other vehicle users on the highway; (8) unreliability.

Electric Tramways.

Advantages.

(1) Lowest known costs of operation.

(2) Great comfort, cleanliness, and good lighting.

(3) Comparative absence of noise and vibration.

(4) Reliability.

(5) Absence of danger from fire and side-slip.

(6) The great improvement of the surface of the roadway.

Disadvantages.

(1) Running on rails, and thus experiencing delay from other traffic.

(2) Need for passengers crossing to the middle of the road when entering or leaving cars.

(3) The need for rails in the roadway objectionable to other traffic.

(4) In narrow roads interference with other vehicles desiring to stop by the pavement.

Reviewing then, impartially, the statements set forth above, I think it must be conceded that the balance of advantages, both to the travelling and non-travelling public, pertain to the tramway system rather than to the motor 'buses.

I should like to point out here that one of the advantages of the motor 'bus, *i.e.*, its ability to get from point to point quicker than a tramcar, may, in the future, well be turned to a disadvantage unless great care is exercised in the control of the drivers. I allude to the abuse of that very facility of avoiding other traffic and passing it, which even now leads to great obstructions of this other traffic on the road, and which, with the increase in the future of motor 'buses plying on particular routes, may, if not carefully looked after, become a public scandal, and be of far greater importance than the mere presence of tram rails on similar roadways.

I will not dwell further on the relative advantages and disadvantages of these two systems from the point of view of both the travelling and non-travelling public, but will assume, for the sake of argument, that they may be both regarded as equally meritorious and advantageous from all points of view, excepting that of cost, which, in that case, must prove a prevailing factor in the consideration of which system offers the public the greater advantage, and I will now proceed to review the question from that point of view.

COMPARATIVE COSTS OF TRAMWAY AND MOTOR 'BUS SYSTEMS.

The total cost, including capital charges, of operating a tramway or a motor 'bus system may vary considerably according to the principles on which the services are conducted. By this I mean that the owners of the transport system, whichever it may be, can run the system only to yield them the most profit with the minimum facilities for the travelling public, or, on the other hand, can run such a system to the advantage of the public with a diminished profit to themselves.

The facilities to the public may be represented by frequency of service and cheapness of fares. With a tramway system, even not in competition with other methods of transportation, the public are to a large extent protected in these respects, since the tramway company, having a large capital invested in both rails, paving, etc., must run a sufficiently rapid service to enable the charges on capital account to be met and still leave a profit. Further, in order to induce the travelling public to avail themselves of the facilities offered, and thus, with a rapid service, fill the cars sufficiently, the charges must be made as low as possible. On the other hand, there is no such guarantee to the public with a motor 'bus service. Here the capital of the company is invested solely in the motor 'buses themselves, with the proportion of depôts and workshops, and has no other consideration in capital expenditure.

Under these circumstances a motor 'bus company, if allowed to operate with a free and unfettered hand, could run just so many motor 'buses, and at just as high fares, as would, in practice, fill practically every seat of each vehicle.

In this way it could earn very large rates per car mile, which, notwithstanding high operating costs, might leave a very handsome return on the capital embarked in the venture.

The public would be the sufferers. They would always be sitting in crowded cars, and would have none of the conveniences offered by cars for the most part half empty, which is, from the traveller's point of view, a great condition of comfort, and, during the rush hours of morning and evening, when the traffic per hour is several times that of other portions of the day, there would be a total inadequacy of accommodation, so that those unable to find room in those vehicles would have to seek other means of transit.

At the same time it must be remembered it would be open to the motor 'bus company to run as many 'buses at different hours of the day as would deal with the then existing traffic. In that case, however, the interest on the money invested in those 'buses not in continual service would still have to be paid, as would also the wages of drivers and conductors employed actively for portions of the day, and it is questionable, if due provisions were made for dealing with the rush traffic in an adequate manner, any perceptible saving would be made by the motor 'bus company over the expenditure which would have to be incurred in running a fuller service at all times of the day, whilst the fact that the passengers would have, at all times of the day, to travel in crowded vehicles would make the service unpopular, and induce them to seek other means of moving about.

I have purposely dealt at length with this argument, which is somewhat academical, since I have noticed that such a proposition

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* A Paper read at the Automobile Club on March 29th, 1906.

LEICESTER CORPORATION TRAMWAYS.

Capital Account—	£
Net purchase price of old undertaking	118,000
Inclusive cost of reconstruction, extensions, and electrification, including power-house... ...	540,985
Total capital...	658,985

Expenditure.		Average per car mile.	£	s.	d.	£	s.	d.
To traffic expenses—								
Superintendence ...		·037	515	2	2			
Wages (motormen and conductors)		1·947	27,119	15	10			
Wages (other employees)		·185	2,569	10	9			
Cleaning and oiling cars ...		·358	4,998	14	7			
Cleaning, salting, and sanding track		·089	1,236	11	1			
Fuel, light, & water (depôts)		·021	289	6	2			
Ticket check, and wages inspectors and clerks ...		·149	2,079	16	6			
Uniforms and badges ...		·084	1,168	17	2			
Miscellaneous		·022	304	1	2	40,281	15	5
		2·892						
To general expenses—								
Salaries (officers and staff)		·068	940	19	2			
Stores expenses		·046	632	17	5			
Rents		·018	252	9	1			
Rates and taxes		·278	3,877	11	11			
Printing and stationery ...		·019	263	17	2			
Fuel, light, & water (offices)		·003	46	6	1			
Law charges		·002	28	16	2			
Compensation		·131	1,819	3	8			
Fire and other insurances		·012	167	7	4			
Miscellaneous		·047	652	0	10	8,681	8	10
		·624						
To repairs and maintenance—								
Permanent way		·018	253	4	1			
Electrical equipment of line		·093	1,293	5	8			
Buildings and fixtures		·024	330	13	0			
Workshops, tools, &c. ...		·008	116	15	3			
Cars		·410	5,709	17	4			
Other rolling stock ...		·003	44	0	4			
Miscellaneous equipment		·005	63	8	2	7,810	13	10
		·561						
	Average per unit.							
To power expenses—								
Salaries and wages ..	·1229	·183	2,548	14	9			
Fuel	·1573	·234	3,259	10	6			
Water	·0096	·013	198	8	2			
Oil and waste	·0219	·033	453	7	7			
Miscellaneous supplies...	·0110	·016	228	9	10			
Repairs to steam plant	·0102	·016	213	8	6			
Repairs to electrical plant	·0034	·005	70	1	6			
Repairs—power station buildings	·0039	·006	82	0	11	7,054	1	9
	·3402	·506						
Total working expenses ...		4·583				63,827	19	10
Estimated future increase in permanent way repairs ..		·142				1,977	10	0
		4·725				65,805	9	10
Interest on capital		1·568	21,826	11	7			
Contributions to sinking fund		·766	10,664	0	4	32,490	11	11
		7·059				98,296	1	9
Renewals of permanent way and paving...		·636				8,858	0	0
		7·695				107,154	1	9

Income.	Average per car-mile.	£	s	d.
By traffic—25,890,030 passengers carried...	7·763	108,111	2	11
By sundry revenue—advertising on cars ...	·079	1,100	0	0
Rents of shops and cottage property ...	·024	329	12	6
	7·866	109,540	15	5

		£	s.	d.
	7·866 ...	109,540	15	5
Expenditure	7·695 ...	107,154	1	9
Profit on one year's working	·171	2,386	13	8

BALANCE SHEET FOR MOTOR OMNIBUSES.

Capital Account—	£
140 cars at £900 each	126,000
Car depôt and offices	48,000
Equipment of workshops	10,000
	184,000

Expenditure.	Average per car-mile.	£	s.	d.	£	s.	d
To traffic expenses—							
Superintendence ...	·037	515	2	2			
Wages of motormen and conductors	1·947	27,119	15	10			
Wages of other traffic employees	·185	2,569	10	9			
Oiling cars...	·280	3,899	5	9			
Ticket check, including wages, inspectors, and clerks	·149	2,079	16	6			
Uniforms and badges	·084	1,168	17	2			
Clearing and fuel, light and water, for depôts, and miscellaneous	·400	5,570	8	3	42,922	16	5
	3·082						
To general expenses—							
Salaries of general officers and staff...	·068	940	19	2			
Store expenses	·046	632	17	5			
Rents	·018	252	9	1			
Rates and taxes	·278	3,877	11	11			
Printing and stationery ...	·019	263	17	2			
Fuel, light, and water for offices	·003	46	6	1			
Law charges	·002	28	16	2			
Compensation, fire and other insurances, and miscellaneous	·560	7,794	5	0	13,837	2	0
To repairs and maintenance...	·55				7,659	6	4
To power expenses—							
Petrol	1·00				13,926	0	7
Total amount of working expenses	5·626				78,345	5	4
Interest and sinking fund capital	·660				9,191	3	7
	6·286				87,536	8	11
Renewals—							
Tyres	2·000	27,852	1	2			
Vehicles, 20 per cent. per annum	1·800	25,119	6	0	52,971	7	2
	10·086				140,507	16	1
Interest and sinking fund on purchase price of old undertaking, £118,000	·424				5,900	0	0
	10·510				146,407	16	1
Income	7·842				109,211	2	11
Loss on one year's working ..	2·668				37,196	13	2

Income.		£	s.	d.
By passenger traffic — 25,890,030 passengers carried	7·763	108,111	2	11
By sundry revenue, advertising on cars ...	·079	1,100	0	0
	7·842	109,211	2	11

has lately been seriously mooted in one at least of the important journals devoted to the automobile industry, and I can only suppose that such a proposition has been made from want of experience of what has occurred in the past in dealing with traffic problems.

If regarded from all practical points of view, it is certain that no monopoly of traffic will be permitted in any large town where such conditions could arise, and that if such a monopoly were to be granted, it would be coupled with regulations as to the services to be run, and the capacity of the vehicles, thus ensuring adequate protection for the public.

On the other hand, if motor 'buses are started in competition with tramways already existing, or if tramways are started, under suitable conditions, in towns where motor 'buses already exist, it is certain that the motor 'bus, if worked on such principles, will cease to exist.

This is an opportune moment at which to refer to the only case I know of in which such conditions have occurred.

Hastings, as you are aware, was served by a system of motor 'buses, which I can, from personal observations, state were kept in good condition, and must have been a source of satisfaction to their shareholders, since they paid, I believe, at the rate of 15 per cent. per annum. Until last year they had no opposition to face from tramways. In the middle of last year the first section of a tramway system, to which my firm were engineers, was put into operation at normal fares, the result being that, long before the tramway system was completed, and within a very few months of its start, the motor 'bus system was entirely discontinued, and those identical motor 'buses are now, I believe, employed in the London traffic.

I have seen, time after time, not only in the daily Press, but also in the automobile journals, predictions that it is certain tramway systems will be superseded by motor 'buses. The incident at Hastings—which, it may be remarked, is not an exceptionally favourable town for tramways, indicates that the reverse of these forecasts is likely to be realised in practice.

There are not many towns in this country where motor omnibuses have established themselves before tramway systems have been installed. Hastings was one of the few places, another is Torquay.

At Torquay also a good motor 'bus service has been firmly established, and, under the conditions of its working, is paying well.

Electric tramways are now being installed at Torquay, and we shall shortly see whether history, as represented by Hastings, will repeat itself there.

I do not wish it to be thought that I do not believe in the future of the motor omnibus, or that there is not an extensive and growing field for its adoption, and I have a few words to say on this aspect of the question hereafter, but I do want to convince those who are interested in the subject, that no amount of newspaper advocacy will keep a motor 'bus on the road one day longer in any particular district than its financial results in that district warrant.

London is pre-eminent amongst large cities as a place where great success may be looked for in the use of motor 'buses, besides the numerous other districts in which tramways will not serve the public so well.

In considering how I could best put before you the financial aspect of the two systems, I came to the conclusion that my purpose would be best served by taking the actual results achieved in a town of medium size running an electric tramway system, and constructing a motor 'bus balance-sheet on the same lines, as if, in fact, the town in question were completely served by motor 'buses instead of by tramways, and I have taken the town of Leicester as the example in question for two reasons:—

(1) That it is a manufacturing town, with a population of about 228,000, and is, therefore, neither one of the largest or one of the smallest towns of this description.

(2) Because the Corporation of that town, which owns the tramways, determined that no expense should be spared in making the tramway system as perfect as possible, with the result that the capital charges to be met are heavier in proportion than would be the case if a good but not so expensive a system were installed.

The system of tramways there has just completed its second year of operation, and although its progress in serving the public interests has been excellent, it has obviously not yet reached the point of earning its maximum revenue, whilst on the other hand, it is quite likely that further experience in its organisation may lead to economies in its running costs. The tramways at present in operation there are equipped with a total of 140 cars, each one seating 48 passengers.

The total length of the route served by these tramways is practically 20 miles, of which 17 miles have double track and the remainder single track with passing places.

Last year the population of about 228,000 was carried 114 times; in other words, the tramways during that year carried about 26,000,000 passengers, and, in carrying these, ran a total of 3,342,000 car miles. In addition to paying its maintenance and running expenses, it has to pay an interest of £21,826 per annum on the capital involved, and a sinking fund to redeem the capital, according to its Act of Parliament, of £10,664 per annum.

The accompanying balance sheet is that for the year ending December 31st, 1905.

This shows a balance over and above all the requisite provisions of ·171d. per car mile, or £2,386 13*s.* 8*d.* This amount will be materially added to in the present year from the increase of revenue now being experienced.

I now propose to compare with this balance sheet of the actual tramway system in operation at Leicester a balance sheet showing how the position would stand if the same service exactly was carried on by motor 'buses as constructed at the present time.

In framing this balance sheet I had hoped to have been able to obtain particulars from those companies using motor omnibuses on a large scale in London of their actual costs of operation and upkeep, but I regret to say that these companies do not feel justified in putting forward any figures at present, owing to the inadequacy of their experience, which, as one of them in a letter I have received justly remarks, could only be regarded as an estimate. Under these circumstances, I have taken, so far as the upkeep itself of the motor omnibuses is concerned, the estimates prepared by a prominent member of this Club in giving advice on the subject.

In framing this balance sheet, I have taken in those costs which would be common to a complete system, whether run by motor 'buses or by electric tramways, and have only varied those items in such cases as differ. I have, however, given the motor 'bus every possible chance.

From this balance sheet you will observe that the total cost of the motor omnibus run on such a large scale, including the renewal of both tyres and vehicles, and interest and sinking fund on the capital invested, amounts to no less a sum than 10·086*d.* per car mile, and that if we add to that the interest and sinking fund on the purchase price of the old horse tramway undertaking, a further amount of .424*d.* would have to be added, making, in that case, 10·51*d.*

Against this, the income, even allowing the smaller vehicles would carry the existing number of passengers, amounts to only 7·842*d.*, so that there would be a net loss on the working of the system of 2·668*d.* per car mile, equivalent to £37,196 per annum, being nearly 25 per cent. of the total working expenses, or nearly 30 per cent. of the gross receipts.

From this it is evident that such a system run by motor omnibuses under prevailing conditions could only be a financial failure, but it must be borne in mind, whatever the academical opinions of promoters of motor omnibus enterprises may be, that it is almost certain no extensive system of such vehicles would be permitted within a town without heavy contributions, in some form or other, towards the paving of the streets, and, in that case, still further capital and renewal charges would have to be made.

These two comparative balance sheets enable me to show where, from the financial point of view, the costs of motor omnibus traction and of electric tramway traction become equal, and, where motor 'bus traction becomes more economical than electric tramway traction.

The amount invested in the permanent way and overhead equipment of an electric tramway system is practically constant per mile, whatever the service of cars might be upon it, and therefore, the interest on this portion of the capital must be divided amongst the car miles run whatever they may be, so that the smaller the service the greater the burden of these capital charges.

Taking as a basis the number of car miles run per route mile per annum, the total cost of the motor 'bus within wide limits, remains the same.

At Leicester the average car miles per mile of route are 167,112. With this traffic it is equal to about an average service of 3½ minutes in each direction. When, however, the car miles per mile of route drop to 45,400, then the total costs of the motor 'bus and electric tramway are equal, and this point is equal to an average service of about 13 minutes in both directions. Below this point the economy in the motor 'bus rapidly increases over that of the electric tramway. These figures at once lead us to a ready perception of the large field which is open for the motor 'bus. In every city or town in which electric tramways exist there are numbers of routes in which electrical tramway undertakings are beginning to exhibit an increasing tendency to use motor 'buses. In all the smaller towns where the minimum profitable tramway service cannot be maintained, motor omnibuses will have the entire field to themselves. So also will be the case in those numerous instances where towns not directly lying upon the railways require communication with these.

I have here indicated but some of the directions in which the motor omnibus can be profitably employed, and, without considering the remainder of their field, it is quite obvious that these alone indicate an enormous use for this system of mechanical propulsion which cannot otherwise be economically carried on in the present state of our knowledge, and I do not think that it is putting it too high to hope that, notwithstanding the very large mileage of electric tramways in use and numbers of cars employed thereon, the motor omnibus may well in these other directions cover a higher mileage, and involve the use of a larger number of vehicles. That being so, I cannot see why those interested in the development of motor 'buses should, as they all seem to, turn their attention to prophesying the ousting of the electric tramway by their favourite vehicle. It will be time to do this—first, when the large field indicated herein for the use of motor omnibuses is exhausted; and, secondly, when the motor 'bus has been so improved as to make it possible to compete financially with electric tramways in the more crowded centres of population.

Of the crowded centres of population London offers a unique field for the use of the motor 'bus. There the tramway system must be carried on under disadvantageous circumstances:—First, because it cannot reach the centres of the City, and, therefore provide through communication; secondly, since overhead wires are not permitted, vastly increased capital costs are experienced in the construction of the electric tramways system.

On the other hand, the vitality of the electric tramway system in London is well shown, since, although it is handicapped so materially by not being able to reach the centre of the City, it nevertheless carries enormous numbers of the public, and has proved itself a most comfortable, profitable and convenient method of travelling.

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PUBLIC SERVICE MOTOR TRANSPORT*.

By W. Worby Beaumont, M. Inst. C.E., &c., &c.

FOR several years attempts have been made to provide public motor vehicle services on a small scale. These attempts were foredoomed to failure, not necessarily because the vehicles were so very unsatisfactory, but because those who started them did not recognise the limitations to endurance of the vehicles they purchased, and the cost of exceeding those limitations. They had long been accustomed to the fact that from 8 to 11 horses are required to work one 2-horse 'bus, but they would not recognise the fact that those 10 horses, condensed into a small mechanism, provided a delicate extract, requiring rest, not so much as rest, as for the equivalent time for small careful attentions to rather intricate mechanical insides. They did not see that although a motor public service vehicle might be capable of earning a very considerable return on the capital outlay, that the total profits on half-a-dozen small vehicles could not offer much to either directors, or managing director, secretary, engineer in charge, running shed foremen, fitters, or for workshop expenses, and hence they usually cut down, or cut out, everything that represented repairs and renewals with the horse vehicles, namely the equivalent to the spare horses, the veterinary surgeon, the shoeing smith, and the coach builder. Failure was inevitable. With from 10 to 20 times the number of vehicles those earlier ventures might have had some chance of success.

Even yet, however, some of the present motor 'bus companies have not learned this lesson—the traffic manager has relatively more power than the locomotive superintendent, that is to say, the motor 'bus is driven out of the running shed whether the stitch which will save nine has been made or not, hence big repair bills and frequent stoppages which should not occur.

It cannot be too strongly impressed upon the purchasers of motor omnibuses that they can only earn money if money is put into them, and that the motor 'bus contains and is propelled by a higher class of machinery than was ever before the present time put into a road or railway vehicle. It is, moreover, not only a high class of machinery, a class absolutely impossible until the past few years, but it comprises a combination of delicate parts which can only be kept in good order by frequent attention by workmen who are taught to feel that though they are not fitting up new machines, they are doing work requiring equal care and conscientiousness, and under superintendents who know when this work is so done.

Although the motor omnibus of to-day will, with its load, weigh over six tons, its engine is, if we compare it with the traction engine of that weight, like a double beat chronometer compared with an old church clock. Of public service motor vehicles there are not only the motor omnibus of the double and single deck types, but the motor cab is now coming into use, and, in the early future, there will be the public or semi-public parcel and goods conveyance vehicles. Of all these there are several types.

The motor 'bus is of two main types, namely, the steam and petrol. The machinery of the Clarkson steam omnibus, for example, is now, without doubt, the most complete and perfect combination of high-class steam machinery, producing a road locomotive automatic in nearly all that relates to combustion of fuel, generation of steam, regulation of fuel and steam generation, regulation of pressure and of feed water, that has yet been put upon the roads.

Several omnibus owners have some of these omnibuses, and more on order, and it is said that the smoothness of action of the steam engine is accompanied by less wear of the driving-wheel tyres, and the absence of change-speed gearing is a point much in favour of this type.

Of petrol-engine propelled vehicles there are three main types; the one in which the power is transmitted to the driving-wheels by side chains, the wheels running on fixed axles. This type is represented by the Straker-Squire omnibus, of which, amongst others, the London Road Car Company has a number, and a large number on order. Of this type, there are also the Durkopp and the Scheibler, the Critchley, the Wolseley, and some Thornycrofts.

Another type of which a large number is in use is the Milnes-Daimler petrol motor 'bus. In this chassis that which is in other vehicles a transverse sprocket-shaft in bearings on the main frame, is carried in bearings on a pair of reach-bars pivoted on the main fixed-axle, and it carries at its ends pinions which gear with internal gear rings on the main wheels. Large numbers of these omnibuses are owned by most of the London companies.

A third type is that in which the driving road wheels are driven by bevel-wheel and pinion on the differential gear, on either a live-axle or what is known as a fixed live-axle, which is much the better form, and in which the tubular part of the fixed axle containing differential and driving gear is extended beyond the springs, and forms a fixed axle on which the wheels run and through which runs the driving axle, fixed only in the nose of the wheel nave, and experiencing only tortional and not transverse stress. Of these vehicles there are the Crossley-Critchley omnibuses, the Brush, the Leyland, and the Ducommun.

There is one other type which is being used now, viz., the De Dion, in which a fixed live-axle is employed, the actual driving axle being in two short parts running through the ends of the fixed axle, which is bent and driven by short universal rods connected to the gear-box, which is placed at the back of the vehicle.

There is also a live-axle type in which, instead of bevel wheel and pinion for driving the live-axle, a worm and wheel on the differential is used. This is the Dennis omnibus, as used by Messrs. Tillings.

When the 32-passenger 'bus began running about two years ago 20-h.p. engines were considered sufficient. Gradually it was found that this was not enough to enable the omnibus to be run when fully loaded at sufficient speed up moderate gradients such as Piccadilly hill. The power was therefore increased to 24 b.h.p., and even this, when the engines are a little out of order, was found to be insufficient to run up such a hill as fast, when fully loaded, as the horse 'buses could be made to go. With gradually increasing sizes of gearing and weight of vehicle, and with the immense distances run per day, viz., from 120 to nearly 130 miles per day, it has been found necessary to have engines which, when in good order, will give 28 to 35 h.p., and many are now being ordered of 40 h.p. and upwards. With many of these omnibuses with these high powers there is trouble ahead, unless the engines can be governed and the governor not tampered with, so that a certain maximum speed cannot be exceeded. I am not very likely to be alarmed by a high speed simply as speed, but am bound to say that unless means be taken by omnibus owners to prevent the excessive speed and racing, which cannot be indulged in without great danger in many places, the matter will be taken out of their hands, or should be. This is desirable, not only because of this danger, but in the interests of those who are providing the public with the convenience which the motor omnibus affords, viz., the shareholders. These high speeds mean rapid wear and tear, and considering how impossible it seems to be to get road surfaces in the greater part of London put under a system of constant inspection and maintenance, as distinguished from remaking, it does not seem at all likely that the high speeds with vehicles weighing six tons loaded, can be indulged in without ruinous cost for renewals and repairs, and this will be particularly felt when the competition which will inevitably come, tempts omnibus traffic managers to cut fares down below the present already ridiculously low rates. The necessity for keeping costs down will, moreover, become pressing if the price of petrol or other suitable fuel rises as it may do, although this is, perhaps, less probable as serious growth in the price might be met by modifications permitting the use of cheaper fuel.

Nearly all, or the greater part of the omnibuses to which I have referred, are of foreign make. British builders have been slow either in entering the field or in adapting themselves to the requirements. In several cases they have turned their attention to the construction of chassis, but have not been content to proceed on well-tried lines, and so have lost time. The Continental builder has had the advantage of experience in design and use of materials, experience which was gained in part before British makers were ever permitted to make an experiment, and before they became alive to the then future possibilities of the mechanical road vehicle. Even now, enormous numbers of foreign motor chassis are on order for this country, and more well-known Continental motor car builders are making ready for immediate production of motor 'bus chassis. Most of these are on well-known and well-tried lines, and the British manufacturers will have to bestir themselves if they wish to stem the tide of this foreign chassis inflow, especially as several of the foreign manufacturers will be able to lower their prices to a figure which the present prices in London do not form a very correct guide. It is necessary to move quickly, and this, almost of necessity, means following the paths now laid down. But at the same time it must be remembered that even now, with all its practical success, the motor omnibus is a young thing, and is not likely to be much less susceptible of modification and improvement than other mechanical things have been. Not only must manufacturers bear this in mind, but it must be remembered also by the omnibus companies.

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* Excerpts from a paper read before the Automobile and Cycle Engineers' Institute at the Royal United Service Institute on March 28th.

There are certain points which in future designs must be met.

Everything must be done that will keep down the cost of renewals. At present the cost of renewals of this order ranges from nearly three farthings to as much as, and even over, three half pence for each mile an omnibus runs, and this forms a large part of the ninepence which, at the outside, should, including the cost of tyres at two pence per mile, be the whole working cost. I cannot, however, here deal with the costs of working as generally obtaining, because the adverse conditions of working even yet would give a false idea of what should and will be the real costs of maintenance. At present the receipts in London average a good deal more than elevenpence, which is the amount the United Omnibus Company proposes to guarantee its associated companies per mile run, and it may be hoped that the various companies will be able to divide up the whole of the London traffic amongst them, so that the receipts may not fall to elevenpence.

It is generally urged by traffic managers that in this country no profit can be made with small omnibuses. So far as wages are concerned there is, of course, a larger proportional cost per passenger mile with the small than with the larger omnibus. There can, however, be no doubt that for many routes and many places the smaller omnibus (say 26 passengers) would better meet requirements on many grounds, and the increased cost in driver and conductor's wages per passenger would probably be more than met by decreased cost of working of the lighter vehicle.

A very large part of the successful working of motor omnibuses depends upon the drivers, and too much care cannot be taken by the omnibus companies in the selection and teaching of men who have the quality of patience as well as strength and power of endurance. It is true that a driver cannot be expected to be a mechanic, but he must be a man who has patience combined with a certain amount of mechanical sympathy, and these qualities must be in addition to readiness and judgment on the road.

Now one word with regard to the daily mileage of a motor omnibus. I have already said that I consider the mileage in many cases run by London omnibuses too much, that is because the time in the carhouse between arrival at 1 a m., or later, and the time at which it must be out of the hands of everybody but the driver is short. The hours of late night and early morning, even with a night staff, are not the best for doing any other than the work which is obviously necessary, they are not the hours for careful inspection, and looking for any defect that may or may not be there, and for looking at and trying everything that may loosen and need tightening or adjustment. This I say, although the number of stand-by omnibuses may be sufficient to enable every omnibus to have from a day to a day and a half per week off the road. The larger repairs for renewals and adjustments, which can be done on the day or day and a half off the road, do, of course, include a certain amount of insurance also against the smaller daily happenings, and they prevent the heavy expenses which follow the want of a sufficient number of stand-by vehicles, but the little cares of every night are of the order which by the expenditure of a penny save a shilling. Here again I would impress upon users the very great importance of having not only proper washing and cleaning places, but of so arranging their carhouses that the omnibus may be run into dry, and in winter warmed, workshops, for the artisans who are expected to, and should attend conscientiously to, every detail of the high-class machinery of a motor omnibus, cannot for any length of time do it in wet, cold, and discomfort.

Hitherto, no great official objection has been made to motor omnibuses running obviously out of repair, and making great and unnecessary noise, but motor omnibus owners cannot expect that their vehicles will be looked upon in the future as not committing a nuisance when they are making a noise which is annoying not only to the people in the streets, but to every householder along the routes they cover. Neither can it be expected that the very objectionable exhaust, which frequently results from excessive lubrication, will be passed over as irremediable, or looked upon as other than a nuisance. It is very well known that it is unnecessary, and it cannot be beyond the capabilities of engine builders to so arrange that excess of lubrication shall not get into the exhaust.

I have not said anything about the use of motor vehicles, whether omnibuses or vans, for the carriage of goods, but that which a year ago seemed only probable, may now be said to be so obvious that it needs no argument and little saying. In many places single deck omnibuses, with accommodation for luggage, will be wanted, and will pay if those who provide them do not, as a first step, reduce the fares and prices by fifty per cent. or more, as has usually been done. The celerity of the motor 'bus or van is alone an inducement sufficient in many places to take and even make a traffic.

Concerning motor cabs it may be said that, although only a little has yet been done in London, a move of importance has been made, and a commercially practicable motor cab is now a certainty of the near future. The Compagnie Francaise des Automobiles de Place has already a large number running in Paris, which easily reach the earnings expected by the company, and would earn even more if the drivers did not gain so much by picking and choosing their passengers. The Compagnie Francaise has over 300 cabs nearly ready for use in a very fine garage near Neuilly. They are by Renault, and are good, comfortable vehicles, but are not suitable for London use, chiefly because their wheel-base is too long to permit turning within a circle, which, it is considered, should be a maximum, having regard to the difficulties which would attend turning without any interference with traffic in many parts of narrower and denser London.

⊗ ⊗ ⊗ ⊗

MOTOR CYCLING.

International Cup Race.

All interested are reminded that entries for this event close on Wednesday, April 18th, at the following fees: Trade; for the first machines, ten guineas; each additional machine, five guineas. Private owners; not receiving payment from any person in connection with this event, two guineas. The Auto Cycle Club Committee is anxious to obtain further donations towards the International Cup Race Fund to help to defray the expenses of the English representatives in Austria, and it is to be hoped that motorists generally, and also clubs, will give their support to the club by making contributions.

Land's End to John o' Groats Trial.

Up to the time of going to press 44 entries have been received for this event, which promises to be a great success. All the principal manufacturers are represented, and the total is made up of 31 motor bicycles and 13 tricars. Entries for this event close at the ordinary fees on May 14th to the trade, and May 25th to private owners.

Fromes Hill Climb.

Motor cycles are eligible to compete in the Herefordshire A.C. event on May 24th. No entrance fee is charged for these. They will be timed from a flying start to a flying finish, but no pedalling will be allowed after passing the starting line. The handicap will be determined on the auto cycle formula as follows:—

$$\frac{W}{C \times T} = \text{Figure of merit.}$$

W = Weight of machine and rider in pounds.
C = Volume swept out of cylinder in mm.
T = Time in seconds ascending hill.

For motor cycles two challenge vases will be presented for the first and second best performances.

One-Third Litre Competition.

At Marseilles a competition for motor bicycles with a cylinder capacity of $\frac{1}{3}$-litre was concluded on Sunday last. The test took place on the Marseilles Velodrome, and has been run in heats during the week. The distance was 100 kilometres; the results were as follows:—

1. Thomas (Alcyon) 1h. 20m. $19\frac{4}{5}$s.
2. Capeaumont (Lurquin Courdert) 1h. 30m. 35s.
3. Dantin (Magali) 1h. 39m. $33\frac{2}{5}$s.
4. Dol (Peugeot) 1h. 44m. $40\frac{1}{5}$s.

TWELVE YEARS AGO.—Sir Oswald Mosley is one of the leading authorities at the principal horse and cattle shows, including the Hackney Horse Society, of which he is chairman. He has been also one of the most ardent huntsmen of his day and at one time served as High Sheriff of the County of Stafford, in which official capacity he had for years to make tedious journeys throughout the country in his official coach. An instance of Sir Oswald starting upon a journey of this sort is shown in the above photograph. In spite of his appreciation and affection for his equine friends, Sir Oswald is now an equally enthusiastic automobilist, his present choice, or "twelve years after," being shown in our other photograph on this page.

A Contrast.

As compared with the 15*s*. formerly earned daily by each horse-drawn omnibus between Nottingham and Sneinton, the Corporation's new motor omnibuses are reported to earn about £8 10*s*. each.

The "Burnett" Pneumatic Tyres.

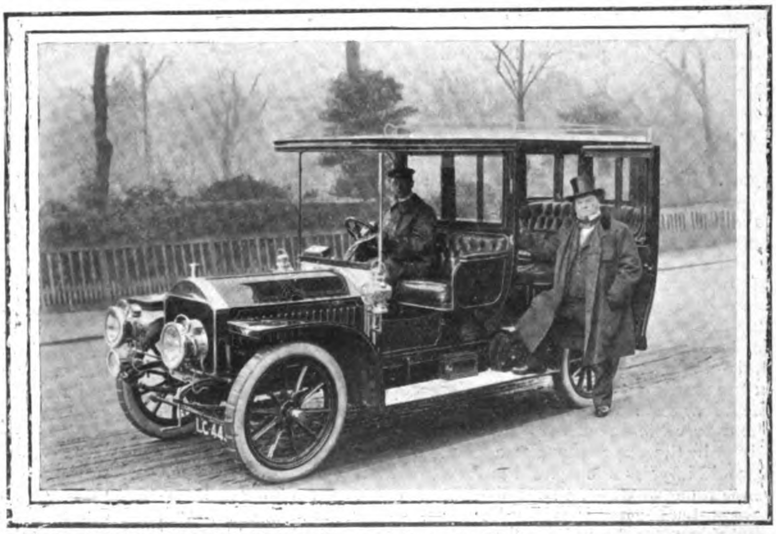
We have received some preliminary particulars from Mr. C. Burnett of some special "tubeless" and "cellular" tyres which have been designed by him for use on automobiles of all kinds. In all cases the outer cover, with or without an independent tread, is secured to the wheel by detachable, beaded side-flanges in such a way as to make an air-tight joint, and thus the usual inner tube is dispensed with. Punctures are either guarded against by the introduction of puncture-proof bands between the outer cover and the tread or by self-sealing strips or linings fitted inside the tyre, while, in certain types, cavities are formed in the external face of the tread with the object of preventing "skidding." For heavy vehicles, several types of outer cover having a cellular construction have been devised, the partition walls between the "cells" only coming into contact with the periphery of the wheel (the steel rim around the felloe) when the load is actually on them.

Motor Marines.

Attention has often been drawn to the capabilities of retired soldiers and other Service men, and to the excellent motor car drivers which they make, after undergoing a moderate period of training. Major Harkness, of the Royal Marine Artillery, a good while ago, arranged a special class for retired marines at Eastney Barracks, near Portsmouth—the progress of which we have noticed from time to time. He now makes a special appeal to some public spirited car owner or manufacturer to place a car at his disposal for teaching purposes. We remember that the Commander of one of the Gordon Boys' Homes was provided with a car for the same purpose in 1905, and this has proved of the greatest benefit in training the boys as efficient and reliable drivers. At least equally good results should be anticipated should a car be similarly placed at the disposal of Major Harkness.

Railway Municipalities and Motor 'Buses.

We referred recently to the litigation which had the result of restraining the Mersey Railway Company from running a service of motor 'buses to feed their local stations at Birkenhead. It would seem that the triumph of the Birkenhead Corporation is likely to be short-lived, for the Railway Company is introducing a Bill in Parliament, which has already received the approval of the Select Committee of the House of Commons, empowering them to adopt a motor 'bus service. A similar Bill being promoted by the Wirral Railway Company, who wish to feed their stations by motor 'bus services to surrounding villages, has also been passed by the same Committee. This Bill was opposed by the District Council of Wallasey, who wished to promote a Bill of their own to give them power to run a similar service, but after hearing the case for and against both Bills, the Lords Committee decided in favour of passing the first stage of the Wirral Railway Company's bill.



AND THE PRESENT DAY.—Sir Oswald Mosley, whose picture in his official capacity as High Sheriff of the County of Stafford appears above, in his up-to-date 40-h.p. 6-cylinder Napier car which he has now for some time adopted as his main form of locomotion throughout the country, while still maintaining his old association with his much-beloved horses.

NEW ISSUES.

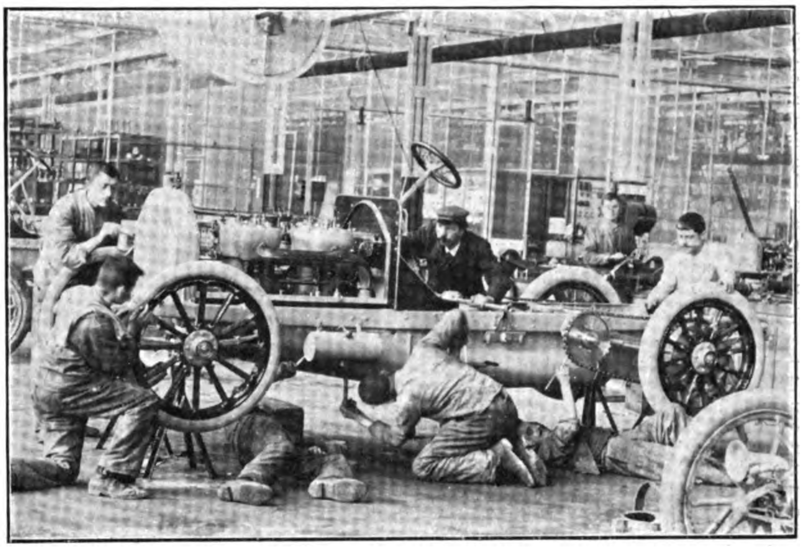
Ariel Motors (1906), Limited.—Formed with a capital of £125,000, an issue of shares in this company is announced this week of 100,000 shares of £1 each. A very encouraging feature of the prospectus is that there is no promotion money being paid, no portion of the capital being underwritten, and there are no debentures or founders' shares. The directorate is a strong and a practical one, and the company, it is announced, have already disposed of their present output for several months ahead. A successful future should therefore be in store for the company.

The object of the company is to acquire the well-known Ariel and Ariel Simplex motor cars, in addition to the freehold motor works, erected at Selly Oak, Birmingham, where the Ariel cars are now manufactured. The valuation of the freehold land and buildings, machinery, &c., alone is £31,124. It is intended to extend the scope of the motor car business by the manufacture and sale of motor engines for commercial vehicles, such as motor omnibuses, cabs, delivery vans, &c.

Mr. Charles Sangster, who has been connected with the manufacture of the Ariel cars since their inception, has agreed to act as managing director of the new company for a period of five years. Already the Ariel Motor Company, Limited, have made substantial profits from the sale of their cars, and the prospectus states that the present capacity of the works is sufficient for an output of 100 standard 25-30-h.p. chassis per annum. With £20,000 more working capital, however, this output can be increased to 175 chassis per annum, which would enable a profit of 20 per cent. to be made, and the output which would be possible upon the basis of the whole of the present issue of shares being subscribed is stated to be 300 chassis per annum, which would represent an annual profit of 22½ per cent. on the whole of the capital offered for subscription. These estimates of profit do not take into consideration profits which would be made on bodies and accessories supplied by the company, nor on the sale of spare parts. The vendors and promoters of the company are the well-known firm of Components, Limited, of Bournbrook, Birmingham. The directors are Messrs. J. F. Albright, A. C. Peebles, Gerard B. Elkington, J.P., J. E. Hutton, and Chas. T. B. Sangster. The secretary and registered offices are Mr. F. Herington, Selly Oak, Birmingham.

Motor Traction Company, Limited, 1905.

A CIRCULAR has been issued to the shareholders of the Motor Traction Company, 1905, Ltd., signed by the Chairman, Mr. F. H. Bromwich, announcing that an agreement has been come to with the owners of both the Daimler and De Dion patents, whereby the licence owned by the Company is brought up to date, and important further privileges are conferred. Notices have been issued calling an extraordinary general meeting of the Company to confirm the arrangement, and it is added that at that meeting the full effect of the agreement arrived at will be explained, and the Chairman has no hesitation in saying that the shareholders will be well satisfied with the efforts made on their behalf by their directors, which, if the agreement is adopted, should result in placing the company on a firm basis.



THE MOTOR INDUSTRY IN GERMANY.—Inside the Mercedes works. Putting the finishing touch to one of the cars, after road testing, before handing over for delivery.

COMMERCIAL POINTS.

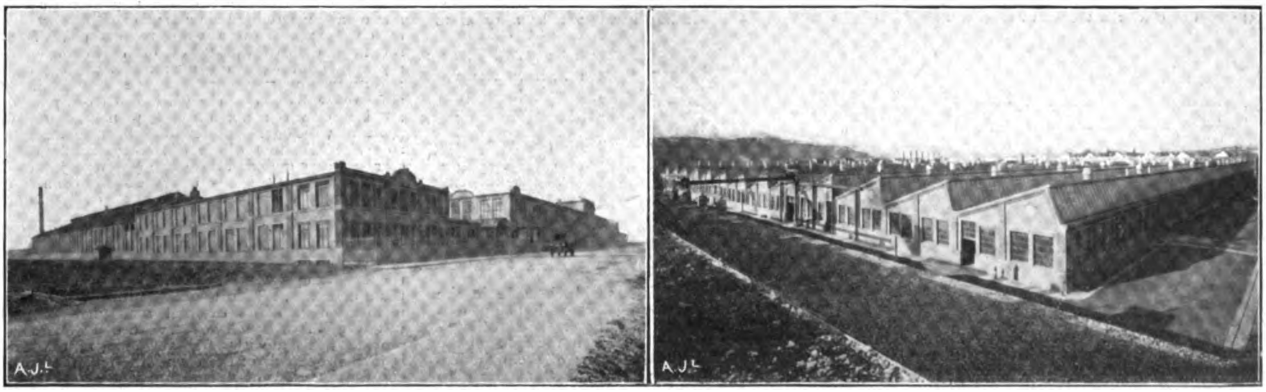
Gratuitous Tyre Repairs.

THE free demonstrating departments inaugurated by Messrs. Harvey Frost and Co., Ltd., some time ago are freely used by the public, but the firm believes there are still some persons who have not yet availed themselves of the useful knowledge which is obtainable there merely for the asking. In order to induce them to call, the firm have distributed among motor tyre repairers, etc., in London and the provinces, batches of passes or introduction cards which entitle the holders to various concessions, such as a free demonstration in tyre repairing by H.-F. process, free and unlimited tuition, and the free repair under the ticket holder's own observation, of any motor tube he may submit for treatment. The cards are obtainable free from any motor trader or tyre repairer, and give the holder special privileges. For all, therefore, who wish to acquire a knowledge of motor tyre repairing, these cards certainly offer concessions which should be taken advantage of.

Reducing Friction.

SUCH is the title of a little book on lubrication which has been issued by the Vacuum Oil Company. It is a well-got-up little volume, and deserves its place on the bookshelf of any practical engineer who is concerned with the running of machinery. It should be especially valuable to motorists.

There are many truths in the pages of this work, and they lose nothing by the American directness with which they are expressed. We give the following as an instance, and as a piece of advice:—"You want the oil that costs least by the hour and month and year. One gallon is as good as ten if it lasts as long."



THE MOTOR INDUSTRY IN GERMANY.—Two outside views of the huge works where the famous Mercedes cars are manufactured. These photographs, which have been supplied to us by Du Cros-Mercedes, Limited, convey some idea of the extent to which the industry has developed in Germany.

THE staff and foremen of Messrs. Humber, Ltd., Beeston, held a very pleasant gathering at the Queen's Hotel, Beeston, on March 23rd. This took the form of a dinner, followed by a concert. Mr. T. C. Pullinger, the manager, presided, and was supported by the prominent officials of the company. Its occasion was the opening of a reading and recreation room at the works, in which the Humber Company, with their usual thoughtful judgment, seek not only to provide recreation out of working hours but also to develop the perceptive and critical faculties of their staff by promoting debates upon subjects of interest connected with the industry. It was very apparent, from the tone of the gathering, that all the officials are working in hearty co-operation and that they are united in the single aim of still further enhancing the reputation of Humber cars and cycles.

For Long Drives.

A VERY useful food to carry while motoring is the preparation made from Horlick's malted milk, in the form of luncheon tablets. These are identical in their constituents with the powder which is now well known throughout the world, and are composed of about equal proportions of milk Pasteurised and combined with the nutritive extracts of wheat and barley malt. For the purpose of the tablets the dried powder is compressed, and it serves as a palatable food of sustaining character. It appeals to motorists, cyclists, tourists, and travellers, as a small quantity can be carried in the pocket, and will, where necessary enable anyone to dispense with ordinary solid food for many hours together.

AT Cordingley's Show at the Agricultural Hall, Islington, no less than 400 Dunlop tyres were, we learn, fitted to cars on view.

THE Right Hon. Viscount Churchill, who had previously owned a 24-h.p. 4-cylinder Napier car, has now ordered a 6-cylinder 40-h.p. Napier with Limousine body. His Grace the Duke of Richmond and Gordon has also ordered a Napier car.

NEW COMPANIES REGISTERED.

The All-British Car Company (Limited).—Capital, £250,000 in £1 shares. Object, to purchase the business of Johnston and Co., engineers and motor car manufacturers, Bridgeton, Glasgow (Scotch company).

British Mercedes Motor Car Company (Limited).—Capital, £100 in £1 shares.

Car and Wheel Construction Company (Limited).—Capital, £6,000 in £1 shares.

Darracq Proprietary Company (Limited).—Capital, £75,000 in £1 shares. Object, to acquire the land and plant at Suresnes, belonging to A. Darracq and Co., Ltd. (incorporated in England in 1903). First directors to be nominated by Ocean Accident and Guarantee Corporation, Limited.

London Central Motor Omnibus Company (Limited).—Capital, £260,000 in £1 shares. First directors, Sir Thomas Skewes-Cox, Sir William Miller, D. H. Redhead, W. B. Richardson, and S. H. Endie.

London and Westminster Motor Omnibus Company (Limited).—Capital, £20,000 in £1 shares.

Mills Motor and Marine Engineering Company (Limited).—Capital, £5,000 in £1 shares.

Monde Motor Company (Limited).—Capital, £1,000 in £1 shares.

National Motor Mail Coach Company (Limited)—Capital, £152,500 (150,000 ordinary of £1 and 50,000 deferred of 1*s.*). Object, to adopt an agreement with the Motor Coach Syndicate, Limited, and to carry on the business of carriers of mails, passengers, &c. First directors, Hon. R. Parker, W. A. Bevan, Lieut.-Col. A. Maude, and G. H. Hayes.

National Automobile Society (Limited).— Capital, £1,000 in £1 shares. Objects, to protect the interests of manufacturers of automobiles, and to establish and maintain a social club.

Old Vics (Limited).—Capital, £100 in £1 shares. Omnibus and motor vehicle proprietors, &c.

The Ridley Motor Company (Limited), George Place, Paisley.—Capital, £5,000 in £10 shares. Object, to acquire the goodwill of the Ridley Autocar Company.

Société des Automobiles Le Passe-Partout (Limited), 84, Bishopsgate Street Within, E.C.—Capital, £6,000 in £1 shares.

Spring Wheel Company (Limited), 34, Norfolk Street, Strand, W.C.—Capital, £1,000 in £1 shares.

Thery and Co. (Limited).—Capital £130,000 (125,000 ordinary of £1 and 100,000 deferred of 1*s.*). To adopt an agreement between E. Lejay and the General Motor Development Syndicate, Limited, and to carry on the business of manufacturers of and dealers in motor cars, omnibuses, &c.

United Motor 'Bus Company (Limited).—Capital, £100 in £1 shares.

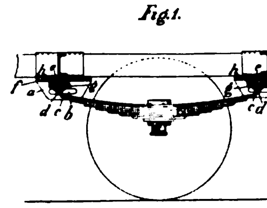
Warwick Wright and Huntley Walker (Limited), 483, Oxford Street, W.—Capital, £47,500 in £1 shares (15,000 ten per cent. preference). Object, to carry on the business of factors of and dealers in motor vehicles, &c. First directors, H. Walker, W. J. Wright, and J. B. Nicholson (chairman).

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

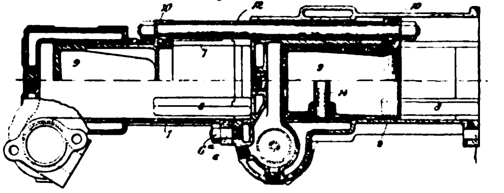
25493. 7th December, 1905. An Improved Spring Mounting for the Wheel Axle of Vehicles. Heinric Büssing, firm of H. Büssing, 40, Elmstrasse, Brunswick, Germany. Date under International Convention, 25th August, 1905. This invention consists of the arrangement of a roller bearing between the car frame and the ends of the wheel axle springs of vehicles, more particularly motor cars, by which arrangement the advantages of an easy, almost frictionless, mobility of the springs in the longitudinal direction of the car is obtained. There are two figures. Fig. 1 is a side view of a spring in which the bearing is shown in central longitudinal section. The box, *a*, attached to the car frame has in the ordinary way two longitudinal slots, *b*, in which a bolt, *d*, surrounded by the end, *c*, of the spring, is guided. The pressure is not transmitted by means of this bolt and slot, but by means of a bearing in which pressure transmission takes place through the intermediary of a number of suitable rollers, *e*. The upper running surface of this bearing is formed by the bottom of the box, *a*, itself or by an inserted plate, *f*, preferably hardened. The other running or supporting surface is placed on an intermediate body, *g*, on which the axleless rollers, *e*, rest, which rollers are held in position by a projecting edge or shoulder, *h*. The body, *g*, bears with its suitably-shaped under side loosely round the end, *c*, of the spring in such a way that the mutual displacement in consequence of the bending of the spring is not affected. Two side lugs through which the spring bolt, *d*, is passed serve for securing it.—March 14th, 1906.

Fig. 1.



4361. 2nd March, 1905. Improvements in or relating to Internal Combustion Engines suitable for Road Vehicles. Harry Livesey, 14, South Place, Finsbury Pavement, London, E.C. In road vehicles fitted with powerful multiple-cylinder internal combustion engines, it has heretofore been usual to arrange the engine cylinders side by side in the longitudinal direction of the vehicle with their pistons working on to a longitudinally arranged driving-shaft, the space available between the sides of the vehicle being too limited to allow of the cylinders and driving-shaft being arranged transversely to the vehicle, which for many purposes is undesirable. This invention has for its object to enable a powerful multiple-cylinder internal-combustion engine to be constructed in a compact manner so as to admit of its being arranged with its driving-shaft transversely to the length of the vehicle within the width usually available in such a vehicle. For this purpose the cylinders are arranged side by side in sets, the cylinders in each set being arranged in tandem with their pistons connected together by external side rods that are connected to such shaft in the usual way as by a connecting-rod and a crank, and the length and arrangement of the pistons and slots being such that the interiors of the cylinders between the combustion-chamber ends and the pistons will not be placed in direct communication with the external atmosphere through the slots. There are five figures. Fig. 3 shows partly in horizontal section and partly in plan one set of cylinders with attached parts. 1 and 2 are the two cylinders of one set of cylinders, the cylinders in each set being made separate from each other and secured together tandem-wise by studs, 6, and nuts, 6*a*. Each cylinder is formed with two oppositely-arranged slots, 7 and 8, and is fitted with a long piston or plunger, 9, that is provided with oppositely-arranged lugs, 10, adapted to reciprocate in the pair of slots, 7 and 8 in the corresponding cylinder, the two lugs or projections, 10, of the two pistons being rigidly connected together by a rod, 12, and the two lugs being similarly connected together by a rod, so that the two pistons reciprocate together practically as one piece. The packing rings of the pistons never uncover the forward ends of the slots. The slots in the forward cylinders serve to place the rear ends of those cylinders, behind the pistons therein, in communication with the external atmosphere. The piston, 9, of each of the rearward cylinders, 2, is provided as usual with a transverse pin, 14, to which is jointed one end of the connecting-rod, the other end of which is jointed to a crank, the arrangement being such that the two pairs of pistons, 9, work on to oppositely-arranged cranks to a common driving shaft, which is arranged transversely of the vehicle and rotates the driving-wheels of the vehicle through driving mechanism.—March 14th, 1906.

Fig. 3.



The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

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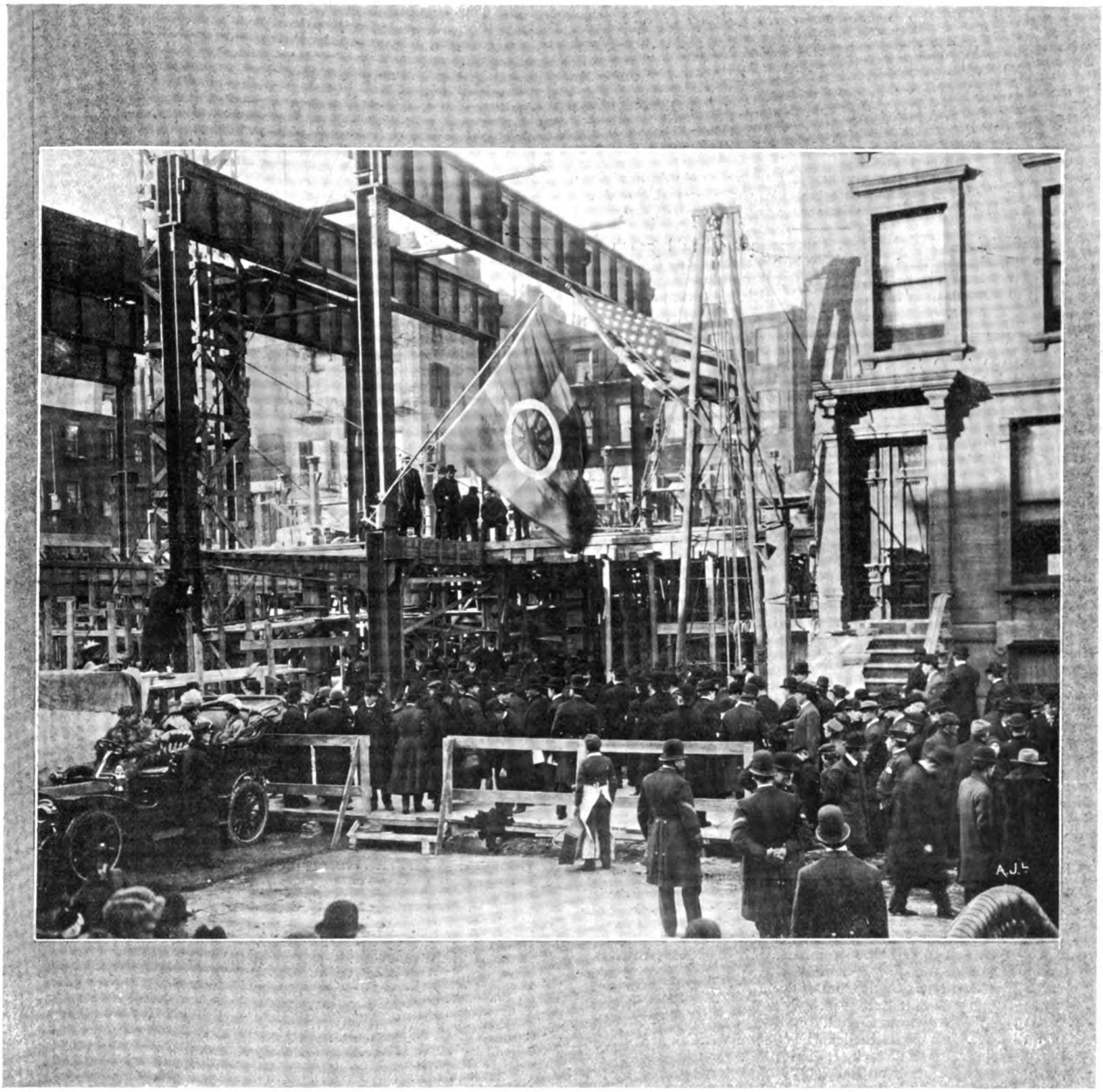

The A.C. of America, as we announced many months ago, secured a site for a new club house in 54th Street, New York, between Broadway and Eighth Avenue. On March 21st sufficient progress had been made for the ceremony of laying the corner stone to be performed. The actual ceremony was performed by Dr. S. S. Wheeler in the presence of a considerable gathering. Our picture shows the ceremony in progress, the following heterogeneous collection of articles being deposited in the corner stone:—"A History of the Club," by George F. Chamberlin; the club book, the club badge, the present automobile laws of all the States, maps showing good roads, published by the club for the use of its members; a model of an automobile, a pair of touring goggles, a statement on their aerial flights by the Wright Brothers, the proof-sheet of "Three Men in a Motor Car," by W. E. Scarritt; a prophecy, "The Future of the Automobile," by Albert R. Shattuck; a book, "A Journey through Other Worlds; a Romance of the Future," by Colonel John Jacob Astor; current numbers of the automobile trade journals, the silver coins of the United States, and the daily newspapers of New York City of March 20th, 1906.

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When any difficulty is experienced in procuring the Journal from local newsvendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

April 21 ... Maple Hill Climb (Hertfordshire A.C.).
April 26 ... "Lubrication." Paper by Mr. J. W. G. Brooker (Auto-Cycle Club).
May 24 ... Frome's Hill Climb (Herefordshire A.C.).
May 26 ... Motor Union Meeting (Birmingham).
June 11–16 ... Land's End to John O'Groat's (Auto Cycle Club).
June 13–16 ... Scottish Reliability Trial.
June 30 ... Ranelagh Automobile Gymkhana (Ladies' A.C.).
July ... Motor Yacht Club Reliability Trials.
July 21 ... Motor Union Meeting (Bath).
Aug. ... *Van Trials.
Aug. 6–18 ... Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Sept. 22 ... Motor Union Meeting (York).
Sept. 27 ... *Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

April 1–15 ... Monaco Motor Boat Exhibition and Races.
April 1–17 ... Budapest Exhibition (A.C. of Hungary).
April 18–26 ... French Resilient Wheel Trials.
April–May ... Milan Exhibition.
May 1–15 ... Paris Voiturettes Trial (*L'Auto*).
May 6 ... "Targa" Florio (Sicily).
May 12–24 ... Tour de France (Motor Cycles and Voiturettes).
May 14–31 ... Milan Reliability Trial.
May 27 ... Motor Bicycle Championship (Moto Club de France).
June 6–13 ... Herkomer Cup.
June 17 ... Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26–27 ... Grand Prix (A.C. de F.).
June 28–29 ... Kiel Motor Boat Races.
July 8 ... Motor Bicycle International Cup Race (Austria).
July 14–17 ... Ostende Meeting.
July 15 ... Mont Cenis Climb (Turin A.C.).
July 26–Aug. 15 Circuit Européen.
Aug. 13 ... Ardennes Circuit.
Aug. 18 ... Coupe de Liedekerke (Belgium A.C.).
Aug. 26–Sept. 2 Brescia Week (Italian A.C.).
Sept. 10 ... Florio Cup Race (Italy).
Sept. 15–16 ... Mont Ventoux Hill-Climb.
Sept. 20 ... Lake Major Motor Boat Races.
Oct. 5–14 ... Leipzig Exhibition.

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* Automobile Club of Great Britain and Ireland Events and Papers.

† Members of the Motor Union are admitted free to these Exhibitions on presentation of their cards of membership.

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PASSING EVENTS.

Assisting or Obstructing the Police? Another instance in which a good-natured individual who did not wish to see motorists fall full tilt into a police trap, and was in consequence summoned for "obstructing the police in the execution of their duty," is announced from Croydon, where William Farmer Little, of Norbury, was arraigned before the justices, last week, on this charge. Mr. Little's offence was as follows:—On Sunday morning he was enjoying his usual walk when he observed policemen arranged at measured distances for a very obvious purpose. He accordingly stepped into the High Road out of pure good-nature, held up his hand and warned approaching motorists of what he had seen by exclaiming, "Police Trap!" and for this good-natured action he was arraigned as above explained. The Croydon Bench, in view, it is stated, of the fact that this was a test case and the first of its kind, are reserving their decision for three weeks, so that they may have ample time to think it over, but, as a matter of fact, it is not by any means the first case of a summons of the kind; and whether anything can be regarded as a test case that comes before a Magisterial Court (as one bench is not bound to take any notice of the decisions of another) is very doubtful. But it is quite evident that the subject ought to be decided definitely by a higher legal tribunal one way or another before very long. Hitherto it has always been held that obstruction of the police in this sense must be either physical or quasi-physical in character. If a policeman is running down the street after an escaping burglar, to insert a stick between his legs so that he should come into violent and undignified contact with the roadway, and thus facilitate the escape of the pursued and presumably guilty quarry, would be undoubted obstruction. But to warn a person whom you may think may be inclined to do so, not to break the law, is in itself a praiseworthy action, and it seems special pleading to argue that its character can in any way be altered by the presence of policemen further along the road who have adopted elaborate arrangements to secure the conviction of the person if he yields to temptation. It is the proud boast of Britons that they are all their own police and entitled to see that the law of the realm is enforced. To set up as a doctrine that nothing must be said to a possible offender to induce him to behave properly because police are lying in wait at some other place to pounce upon him if he does not, would be a strange departure. In fact, in our opinion, the whole matter rests on an utterly false and improper indictment, and as it is a point of law wholly and solely, it is one on which only a decision of the Divisional Court can possibly be accepted as final.

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To Contest Incompetence. The ever-perplexing question of the reckless driver is very closely associated with that of the incompetent driver who endangers the safety and destroys the comfort of other road users, not of *malice prepense*, but simply because, while he wishes his car to do one thing it usually does another. Thanks, therefore, are due to Mr. H. Norman, M.P., for his article in the current number of the *Fortnightly Review* on "The Public, the Motorist, and the Royal Commission," in which he subjects the two allied questions to a very thorough ventilation. Mr. Norman, after lengthy reflection, comes to the conclusion that no one should be allowed to drive an automobile without undergoing "some serious test" of his capabilities. If every driver were competent, thinks Mr. Norman, the chances of accident and serious annoyance to users of our roads will be immensely diminished. He does not, of course, deny—he fully admits—that skilful drivers are not always free from blame, but still, elimination of incompetents would get rid of the greater amount of the existing trouble. So far, everyone, or nearly everyone, will agree with Mr. Norman. They will also agree with him when he proceeds to urge that any such compulsory test of capacity must be a real one, and not a mere formality as in France, where it is regarded by most people as bordering on the farcical. In fact, Mr. Norman's contention practically seems to be that no one should be allowed to drive a motor car unless he has passed one of the excellent examinations for driving certificates which the Automobile Club have been at so much trouble to organise, and have organised and carried out so well.

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A Counsel of Perfection! It is a highly attractive ideal. That every car in the country should be driven by an expert and that no one who is not an expert should be allowed near the steering wheel, is an ideal that has something so supremely rational about it as to be suggestive of Lord Bacon's New Atlantis or perhaps of modern Japan. The practical question is, can the ideal be realised? To carry it out would obviously involve an enormous and expensive organisation. Such a scheme would unquestionably require Government recognition and support. Given that, however, and the cordial co-operation of county clubs with the A.C.G.B.I., the thing is just thinkable, and perhaps then it would be worth the trouble. Whatever is done, however, there must be no precipitancy. The most ample notice should be given—say, a notification that in three years' time all drivers will be required to hold the certificate—or hardship to individuals and serious hampering of the industry would surely result. Perhaps, after all, things are not proceeding altogether too badly as they are at present.

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The Motor Union and the Same Question. A step in the right direction, and an attempt, though a modest one, towards the realisation of the ideal referred to above, has been the action of the Motor Union in regard to the training of drivers and mechanics, to which we have referred from time to time since it was first inaugurated last autumn. A report on this branch of the Union's activity has just been presented to the general committee, and, appropriately enough, almost at the same moment as Mr. Norman's article appeared in the *Fortnightly*. The Union, or rather, the special committee dealing with the question, has made its influence effectively felt in two important directions. It has encouraged the pupils of teaching establishments to present themselves for the club examination, and it has done its best to see they are in a position to pass it by supervising, and, as far as possible, rendering adequate the arrangements made for their instruction by the various existing teaching institutions. This it has sought to accomplish, and to a large extent has accomplished, by establishing "a recommended list" of approved institutions—the establishments to appear on this list being only admitted after the inspecting committee have satisfied themselves of the adequacy of the arrangements made. Altogether the commencement made by the Union has proved a valuable one. In accordance with the arrangements made for division of functions between the Union and the Club, the Club now takes over this particular sphere of usefulness, and as the Club is the body which conducts the examinations, there are obvious advantages in the transference. The new ground has, however, been well and wisely broken by the Union, and the Club will, it is to be hoped, before long be able to raise upon it a satisfactory crop of certificated drivers.

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The Motor 'Bus in Debate.

The prolonged, valuable and suggestive discussion at the Automobile Club on Mr. E. Manville's paper, of which we gave a comprehensive summary last week, will probably prove to have been epoch making in the annals of the A.C.G.B.I. There has never been such a discussion before, either as regards length, the valuable and suggestive character of the observations made by those who contributed to it, or the representative character and high reputation of the speakers who expressed their views. Electric tramway men of the widest experience, electric tube engineers, motor 'bus builders and users, representatives of important commercial interests, and —of no less note—the secretary of the Royal Commission on London Traffic, and the Lord Justice Clerk of Scotland—who has always got something fresh, entertaining, amusing, and enlightening to say on any motor problem—met in full, free and unfettered debate. The result has been to make everybody feel very sorry that previous papers read before the Club have not been followed by discussions on something of a similar scale, and that invitations to take part in them have not been extended to, or accepted by, an equally wide circle of representative technical and professional men. This discussion, at any rate, was worthy of the great scientific and technical societies, and may be said, without exaggeration, to have still further raised the general tone and status of the Automobile Club.

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Room for both 'Bus and Tram.

The struggle, or the friendly rivalry, between the electric tram and the motor 'bus which is just beginning, constitutes one of the most important locomotion problems that at present confront us. It is probably *the* problem of the day, and the Club has accordingly done excellent service in affording hospitality to the discussion in which the numerous questions involved have been considered from almost every possible point of view. On the whole, the general consensus of opinion was that, at any rate for a long time to come, both the motor 'bus and the electric tram are bound to have their own individual spheres of influence. As examples in point, the West End traffic, where the motor 'bus is always likely to be the favourite, and the East End, where the conditions of population are such that there is nothing to deprive the tram of the popularity which it undoubtedly possesses, were, as regards London, specially mentioned. At present, too, there seem to be grounds for the belief that where enormous numbers of travellers have to be "shifted" daily, and where other wheeled traffic is not congested, the motor 'bus is not at all likely to compete successfully with the electric tram.

The Question of Cost.

It would not be right to omit pointing out, however, that the relative estimates of cost of 'bus and tram, as put forward by Mr. Manville, were traversed with a good deal of directness by several of the speakers. Several thought, and they had figures and statistics at their fingers' ends, that his estimate of the cost of running trams was too low, and his estimate of the cost of running motor 'buses somewhat too high, while others—and there were some tramway men among them—questioned whether the Leicester tram installation was one which it was quite fair to take for the purposes of comparison, the conditions being decidedly *sui generis*, the cost per unit of electric power being abnormally low. But on a point of this kind, where experts differ, our readers must be left to form their own opinion.

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The Electrical *v.* the Automobile Press.

On one point, at any rate, we think we are justified in pointing out that some of the statements were rather *ex parte*. The automobile Press was taken to task for being unduly biased in favour of the motor 'bus, but no one seems to have pointed out how inimical and prejudiced the attitude of the electrical technical Press has been to the new locomotion. The most enthusiastic champions of the motor 'bus have never said half the unkind things about the electric tram that have been said about the motor 'bus in papers identified with the tramway industry, and this attitude dates from a time when the prospects of the motor 'bus ever becoming a dangerous competitor were very different from what they are now. It was an industry in its cradle which was being assailed.

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En Résumé.

To sum up the general results of the debate—it may be said that the majority of opinions tended to the view that the future of the motor 'bus movement was very largely a question of road improvement. The competitive powers of the motor 'bus, of course, mainly depend upon the right in traffic of each individual vehicle, and that directly depends upon the quality of the roads they run on. In this respect the London motor 'buses are going through an awful apprenticeship on that terror of a road, as Mr. Burford called it, the wood pavement. Above all, however, *organisation* is the one thing pre-eminently needed, and, no doubt, Mr. Burford was speaking by the book when he declared that there was not a single motor 'bus company in the country that was properly organised. It must not be forgotten, however—and this was one of the most interesting points dwelt on in the discussion —that the motor 'bus is, as Sir John Macdonald humorously put it, "still an infant," and that breakdowns were much more frequent in the early days of electric traction, according to Mr. McMahon—and no one can know this better than he—than they are even at present in any motor 'bus service. All these considerations should lead prospective investors to approach with discrimination further motor 'bus promotions—an attitude which we have frequently endeavoured to impress upon our readers in the past. On this point, speakers of such authority as Mr. Straker, Mr. Burford and Mr. Schenk expressed themselves with remarkable force, and in almost identical language, regarding this danger as the worst which threatens the movement.

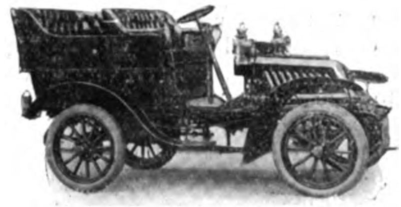
How to Recognise the Cars of To-day.

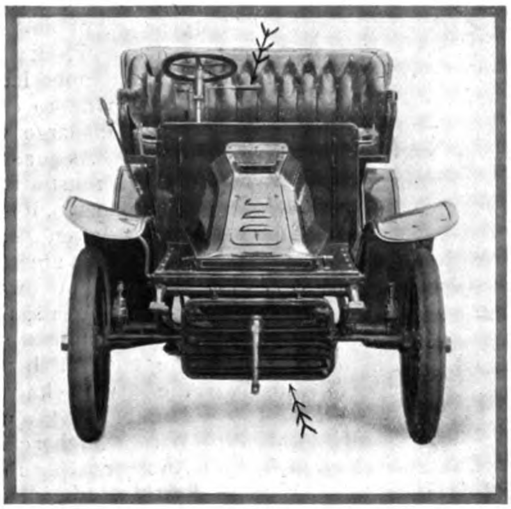
(No. 19).

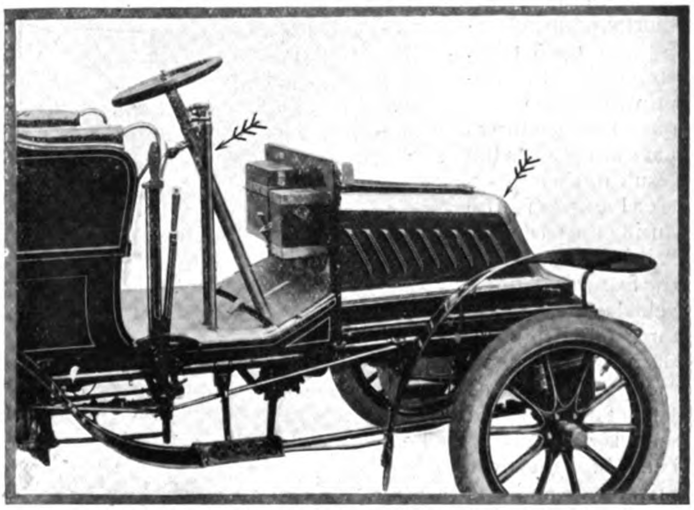
The De Dion

(FRENCH)

6, 8 & 9 H.P.

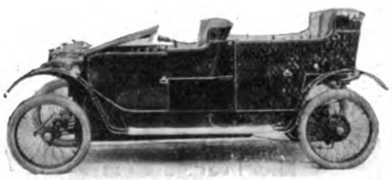






Among the present models only those specified above have the SLOPING BONNET, the RADIATOR BENEATH THE FRAME, and the VERTICAL COLUMNS FOR SUPPORTING THE CONTROL LEVERS. Prior to 1905, however, the 12 H.P. Model was also of this type.

* * *

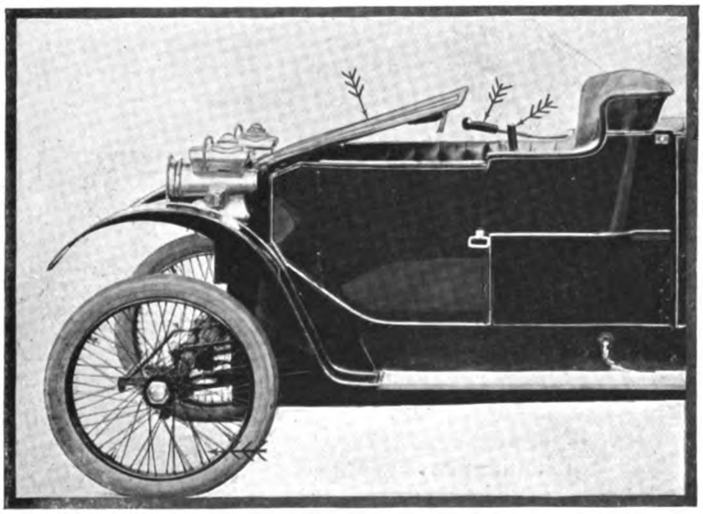


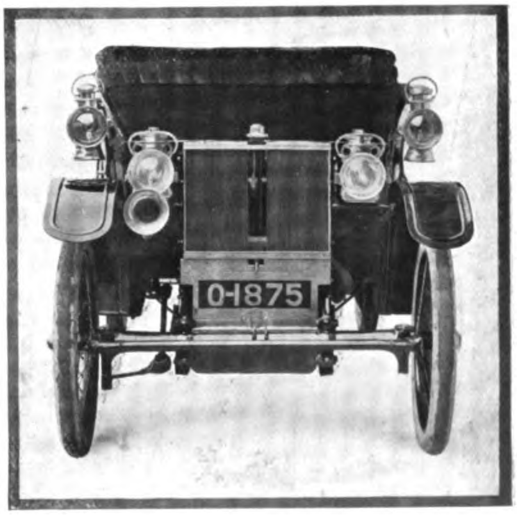
(No. 20).

The Lanchester

(BRITISH)

12 & 20 H.P.

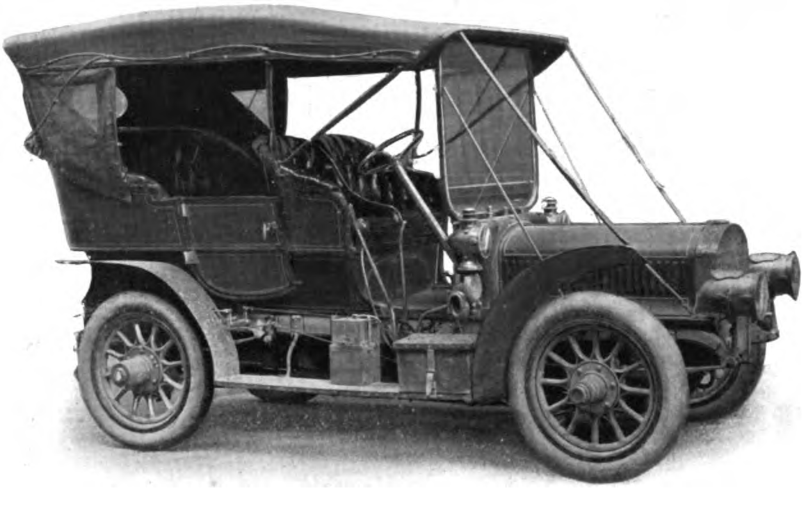




Both Models are alike as regards the PECULIAR GENERAL DESIGN of the car as a whole, but the smaller is not fitted with the front RADIATOR which characterises the larger model. Among the interesting details visible externally are the WIRE WHEELS, HINGED DASH, and SUSPENSION of the front and rear axles. The SIDE TILLER STEERING, and the single control lever are also noticeable.

THE FOUR-CYLINDER CADILLAC— A NEW VERTICAL MODEL.

FOR the past twelve months the famous Cadillac Company, of America, have been building a powerful 4-cylinder model, having a vertical engine, in addition to the single-cylinder vehicle, which has for long been so deservedly popular in this country. Hitherto none of the 4-cylinder cars has been seen in England, but the Anglo - American Motor Company will shortly be introducing the 1906 type, embodying the improvements which the manufacturers have adopted as the result of their practical experience during the past year. A brief summary of the features of these vehicles is, therefore, opportune at the present moment, more especially as one of the original models has recently been brought over privately, and is already attracting attention in the A.C.G.B.I. trial of the Hedgeland free-wheel hub, to which we refer elsewhere.



The 30-40-h.p. Cadillac Car.—This photograph represents one of the 4-cylinder vertical-engine cars turned out last year. It is the first model to reach this country, and was brought over by a private owner. Several important improvements will be embodied in the new models which the Anglo-American Motor Company are placing on the English market shortly.

It is of this particular vehicle that our photograph showing the complete car has been taken, and our other illustrations are also of the same model. Some important modifications have recently been introduced in the minor details of construction, but in general, we understand, the latest model is not essentially different. Although in general appearance the car is similar to that of the typical modern motor vehicle, yet it is, mechanically, a distinct departure from orthodox practice in design. Most noticeable of all is the adoption of a change-speed-gear of the epicyclic type, for there are few cars of such high power, 30-40-h.p., in which this mechanism is used. On small cars of the runabout type the epicyclic gear is, of course, well known, but very few attempts have been made to employ it on large vehicles. As our sectional illustration, Fig. 1, shows, it is a shaft - driven car, which is an unusual arrangement with epicyclic gears, the only examples in the country being the well - known Lanchester and Wilson-Pilcher cars. Another peculiar feature, considered in relation to the epicyclic gear, is the presence of a main clutch. It is of the double-plate type and is operated by a pedal as in all modern vehicles. The engine has separate cylinders, and each is similar to that on the engine of the single-cylinder car. A description of the special construction adopted appeared in our issue of October 31st, 1903, and it will be remembered that the cylinders themselves are of cast iron, but have separate heads and separate copper water-jackets. The heads are entirely of cast iron, and

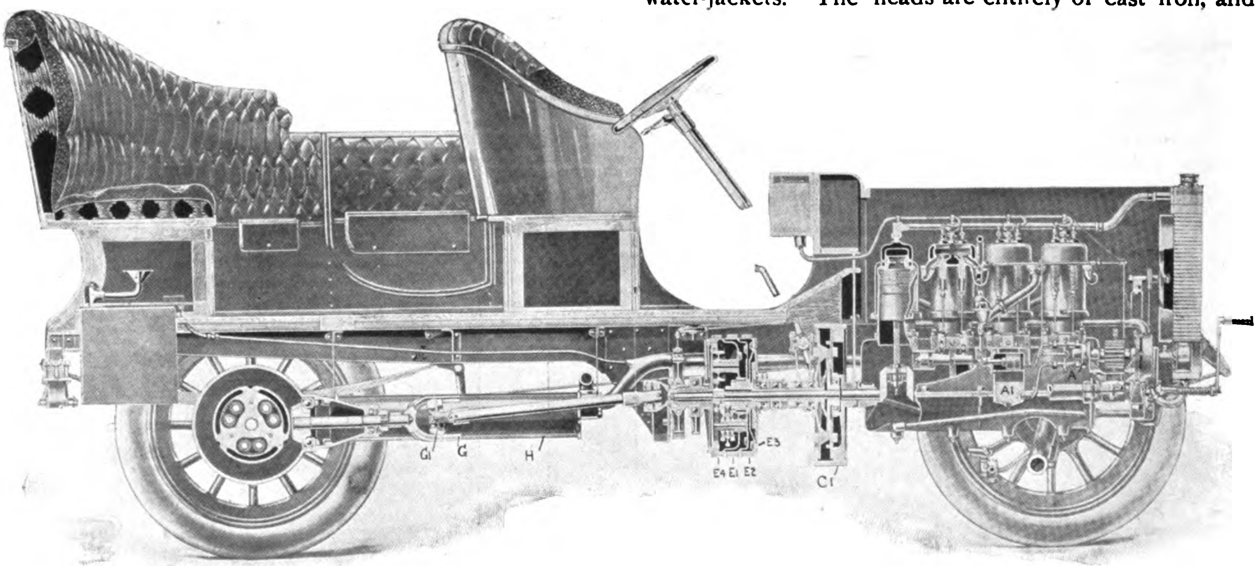


Fig. 1.—The 30-40-h.p. Cadillac Car. Sectional elevation of the complete car, showing the arrangement of all the principal parts.

they are so held down on to the cylinder-jacket that they keep it watertight at that end. At the bottom end the jacket is clamped in place by a large ring which, in the four-cylinder engine, is constructed to screw down from above instead of being secured by bolts. The cylinders of this engine have a bore of 4⅜ ins., while the stroke is 5 ins., and it is one of the peculiar features of Cadillac engines, retained on this model, that the inlet-valves do not close, at full load, until after the piston has passed the outer "dead-centre," and has returned a distance of 1⅜ inches on its compression stroke. The variable lift for the inlet-valves is, in this case, obtained by sliding the cam-shaft, which has tapered cams, longitudinally, and an interesting hydraulic (oil) governor is employed on last year's 30-h.p. car for automatically moving the cam-shaft to control the speed. For this purpose, the cam-shaft, B (Fig. 2), is connected by an operating-fork, A^5, with the piston-rod, A^4, of the mechanism. A gear-wheel pump, A, draws oil from a reservoir, A^1, and forces it behind the piston, A^3, thereby tending to push out the piston-rod, A^4, against the action of the spring, A^6, and so, indirectly, to reduce the lift of the inlet-valves. There is a variable by-pass, A^2, by which the oil can be returned direct to the reservoir, in which case the spring, A^6, holds the cam-shaft in the position of maximum lift. This valve is under the control of the driver, but it is obvious that an increase in the engine speed will increase the oil-pressure behind the piston, and thus automatically tend to reduce the lift of the inlet-valves and prevent racing.

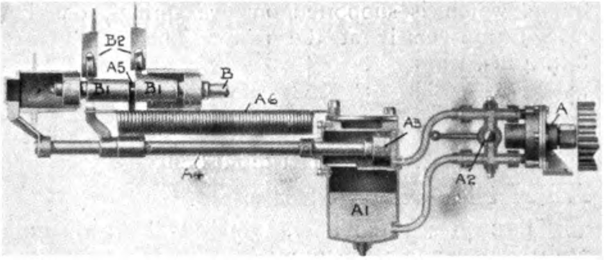


Fig. 2.—The 30-40-h.p. Cadillac Car. View of the oil governor mechanism which controls the variable lift of the valves by moving the sliding cam-shaft.

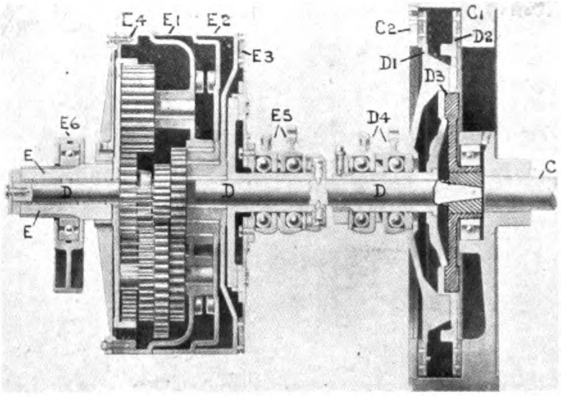


Fig. 3.—The 30-40-h.p. Cadillac Car. View of the main clutch and the epicyclic gear which provides three speeds and a reverse.

Another point of considerable interest on so large an engine is the retention of the Cadillac mixing valve in place of an ordinary float-feed carburettor. In this device, the petrol jet is normally closed by a spring-controlled needle valve, which carries a diaphragm. Suction acting on the diaphragm admits petrol, which is caught up by the passing air and vaporised. On the 4-cylinder car, an automatic auxiliary-air valve is fitted, but only one mixing valve is used for all four cylinders, and it is the same size as on the single-cylinder car. Petrol flows direct from a small tank on the dashboard to the jet, but the main supply is carried in a tank at the rear of the frame, from which it is forced into the auxiliary tank by exhaust pressure.

Ordinary high-tension ignition is employed, and there is a separate coil for each cylinder. The low-tension commutator is mounted on the cam-shaft, which is prolonged to the front of the bonnet. Instead of projecting, however, a space is formed for the commutator in the radiator-frame, which adds to the neatness of the design and, at the same time, makes the front view of the car distinctive. The radiator itself is of the honeycomb type.

Immediately behind the engine is the fly-wheel, C^1, which also forms part of the clutch. A ring, C^2, is bolted to the face of the fly-wheel, as shown in Fig. 3, and between this ring and the fly-wheel itself are two leather-faced friction-discs, D^1 and D^2. These plates are forced apart into engagement with the fly-wheel by a strong spring, and they are disengaged by suitably arranged ring-cams, D^4. The power is transmitted through them to a driving-spider, D^3, which is fixed to the squared end of the shaft, D. This shaft passes straight through the gear-box and spigots into the hollow transmission-shaft, E, which is carried by the ball-bearing, E^6, attached to the frame. Engine and gear are both carried by a tubular underframe, and can be removed as a complete unit.

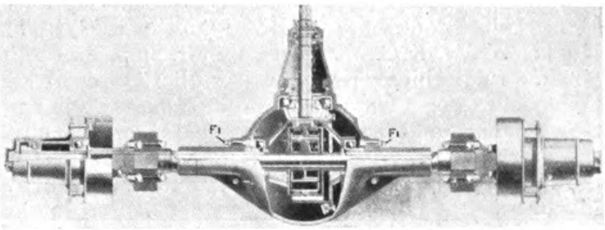


Fig. 4.—The 30-40-h.p. Cadillac Car. View of the back axle, showing upper part of the casing removed.

Three forward speeds and a reverse are provided by the epicyclic-gear, which is constructed on the same lines as that used on the small Cadillac cars, and has only one additional moving element. The reverse, first, and second speeds are obtained by holding the brake-drums, E^4, E^1, and E^2 respectively, while the third speed is engaged by the disc-clutch, E^3. On the top gear, which gives a speed of 50 miles per hour, everything revolves as a solid mass, so that there is a direct-drive from the engine to the live-axle. Ring-cams, E^5,

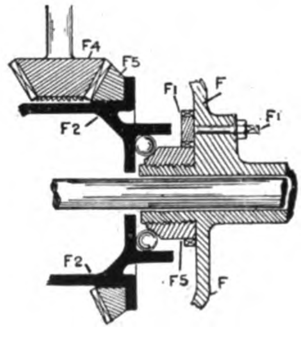


Fig. 5.—The 30-40 h.p. Cadillac Car. Sketch showing the adjustment for one of the ball races on the shell of the differential-gear.

are, it will be noticed, used for operating the high-speed-clutch, as they are for the main-clutch.

Two universal joints are provided in the propeller-shaft; that at the far end being also telescopic. The latter coupling is of rather unusual construction, the members consisting of a **V**-grooved block sliding in a fork having **V**-section prongs. There is also a very peculiar feature in the live-rear-axle. It consists of an adjustment (Fig. 5) whereby the big bevel-wheel, and the differential box which carries it, may be moved axially on the shaft in order to correctly set its mesh with the driving-bevel-pinion.

For this purpose the ball-races, F^5, which support the differential-box, F^2, are cut with a screw thread corresponding to that on the axle-casing, F. In order that their position may be conveniently adjusted from the outside they are also provided with toothed peripheries which engage with small pinions, F^1. These pinions are solid with spindles that pass through the differential-casing, and the bearings can, consequently, be adjusted from outside by means of a spanner. For convenience in inspection the differential-case is split axially, so that the top half is removable. Tubular extensions of the casing support the road wheels, which run on ball bearings.

Pressed-steel side-members are used in the main frame, which is supported on five springs, one being placed transversely at the rear. The wheel-base is 8 ft. 4 ins.

* * *

A Successful Appeal to the Divisional Court.

OUR readers will call to mind the case of Mr. Heywood, who some time ago was arraigned before the Bedford Bench for driving to the public danger, one of the witnesses against him being the Mayor of Bedford, who "laid the information" on which the proceedings against Mr. Heywood were taken, and who also sat on the Bench when the case was tried and retired with the magistrates to consider it, although he stated that he would take no part in their voting or their decision. An application has now been made to the Divisional Court (the Motor Union contributing £20 to the expenses) by Mr. Horace Avory, K.C., instructed by Mr. Staplee Firth, to obtain a rule calling on the justices to show cause why their conviction should not be quashed, on the ground of the prejudiced and biased action of the Mayor. The rule asked for was granted by the Lord Chief Justice, and the Bench having failed to show that the action of the Mayor was justifiable, the Divisional Court has quashed the conviction on the ground of prejudice and bias. The fine which Mr. Heywood had to pay will accordingly have to be reimbursed to him, and the endorsement on his licence revoked. Mr. Heywood, the Motor Union and their joint legal advisers have every ground to congratulate themselves on the result, as it is the first case in which the Divisional Court has quashed a conviction against a motorist on the ground of bias, though, as our readers are but too well aware, bias has been but too frequently displayed by magisterial benches.

Automobile Events in Spain.

THE present summer, which will in all human probability witness the nuptials of the King of Spain, is likely to be a gala year in the Iberian peninsula, and quite appropriately, therefore, two automobile events have been organised—one for the month of June, in which the royal wedding will take place, and the other for the month of August. The first event has been specially arranged in connection with King Alfonso's marriage, by the Cycle and Automobile "Chambre Syndicale" of Spain, and a definite programme of the meeting is to be arranged by representatives of the above body in combination with the Duke of Santa Mauro.

In August, an automobile meeting is to take place at Corunna, which, in recent years, has become an important port, when it is hoped that a number of well-known French drivers will take part. The neighbourhood is said to be not only of considerable interest, but also to possess excellent roads.

A.C.G.B.I. RELIABILITY TEST.—The Dennis car which, as we recorded last week, completed its 4,000 miles "non-stop" run under the official supervision of the Automobile Club. This excellent performance constitutes a record under official supervision.

THE HEDGELAND SOLID LIVE-AXLE.

A device for eliminating the differential-gear in cars (chain-driven as well as live-axle), which is now being officially tested by the A.C.G.B.I., and for which non-skidding properties are claimed.

Differential gears have now become so much part and parcel of the modern car that it almost savours of vandalism to suggest its abolition. There is, of course, no novelty in a solid live-axle, but, although a few small cars even now use it, this form of construction has not hitherto been considered very seriously by automobile engineers. There has recently come to this country from the United States of America, however, an invention in the form of a free-wheel hub for which many advantages are claimed and it, the makers assert, renders the solid live-axle a thoroughly feasible member on a modern car. Not only are the well-known mechanical difficulties of ordinary free-wheel mechanisms said to be satisfactorily overcome, but the makers claim protection from side-slip as an inherent property of "non-differential" cars, and, in consequence, as an advantage of using their system. On these grounds alone, therefore, the Hedgeland axle, which is made in America by the Webster Manufacturing Company, is worthy of close consideration by all motorists.

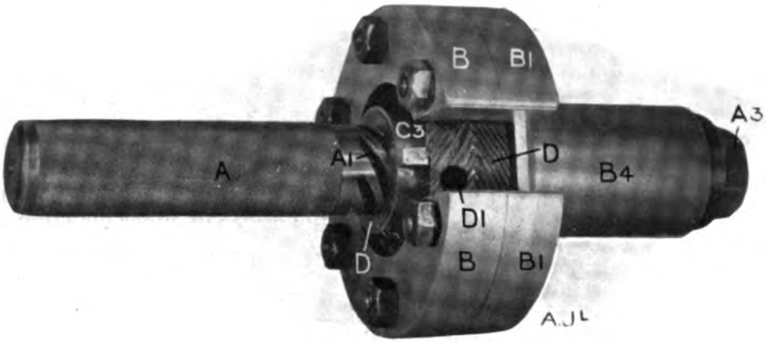


Fig. 1.—The Hedgeland Free-wheel Hub.—View of a Model cut open to illustrate the principle of action, and showing the double Cone-nut, D, which rotates with the Solid-axle, A, and engages with the Hub, B, by frictional contact.

Its Non-Skidding Properties.

There is nothing in the actual details of the particular free-wheel mechanism in question which gives rise to this non-skidding claim, which is based solely on the properties of a solid live-axle with free-wheel clutches, as against a divided axle with a differential gear. A differential gear is, of course, a mechanism which drives both wheels equally fast so long, and only so long, as the resistance offered by both wheels to being driven is the same. Should one wheel come upon a greasy surface, for instance, that wheel will, as is well known, slip and will revolve at a higher speed than the other. Apart from the drawback of this slipping action as being detrimental to the tyre, it should be remembered that the tractive effort is thereby reduced on *both* wheels so that the car ceases to be driven by the same force, and may, if the wheel is slipping very freely, cease to be driven at all. This is, naturally, all the more serious if the car approaches the slippery patch at such an angle that its momentum tends to make it skid.

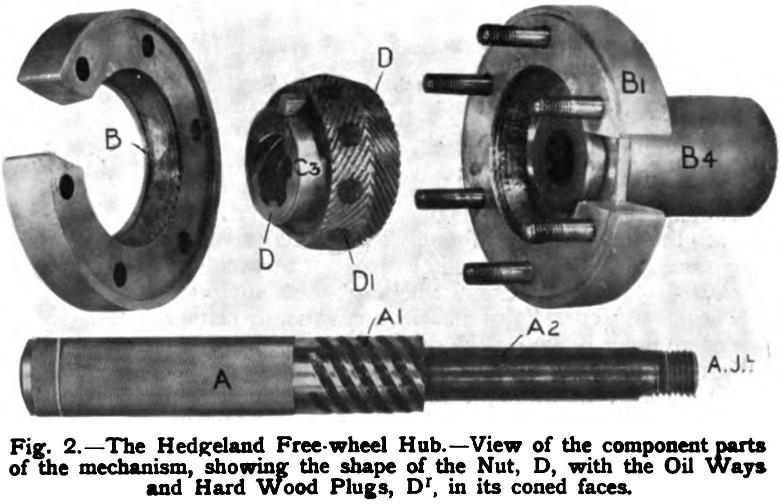


Fig. 2.—The Hedgeland Free-wheel Hub.—View of the component parts of the mechanism, showing the shape of the Nut, D, with the Oil Ways and Hard Wood Plugs, D^1, in its coned faces.

There is also another case where one wheel meets an obstacle which momentarily retards its rotation; this also may cause the other wheel to be driven correspondingly faster, and if the adhesion of that wheel is still normal, it does not, in this case, slip, but exerts instead a strong tendency to slew the car to one side, and possibly to make it skid. Both these examples frequently occur with literal exactness in practice, but they are more important as illustrations of the effect on a car fitted with a differential gear, due to the constant variation in the equality of the drive which must occur in any type of motor vehicle when it is travelling over even moderately smooth roads. Stones, hollows, and other unevennesses on the road-surface, as well as unequal loading of the car, adjustment of the brakes, and friction in the axle-bearings, are all among the direct causes of this kind, one and all of which are apt to be even further emphasised by any resultant bouncing of the tyres on the ground.

With a solid live-axle, the propelling power of each wheel is entirely independent of the adhesion of the other wheel on the road. With a differential gear between them, one wheel has to act as a fulcrum for the other, so that if the resistances are unequal the resultant drive on the car is not direct ahead; but this slewing force is not present in a solid live-axle car. If, for instance, one wheel of a solid live-axle meets an obstacle, it either has to climb straight over it or the car must stop. With a differential gear on the axle, that wheel is allowed to slow down while the other wheel is permitted to proceed and to slew the axle itself round the obstacle as a centre.

Pros and Cons of the Solid Axle.

From this point of view, the solid live-axle—or what is equivalent, in the case of a chain-driven car, the solid countershaft—has everything in its favour. It is true, however, that only one wheel is driven when the car is turning round a corner, but as there is no reason for turning to the right more often than to the left it may be assumed that the "additional" wear is the same on both tyres. It will, of course, be apparent from this that if one wheel is larger in diameter than the other then the car will be perpetually driven by that wheel only. This is theoretically the case, but we understand that Mr. Hedgeland has satisfied himself by tests that in practice the very inequalities in the road which produce the slipping and bouncing already referred to, fully neutralise any difference in tyre diameters which may reasonably be expected to exist.

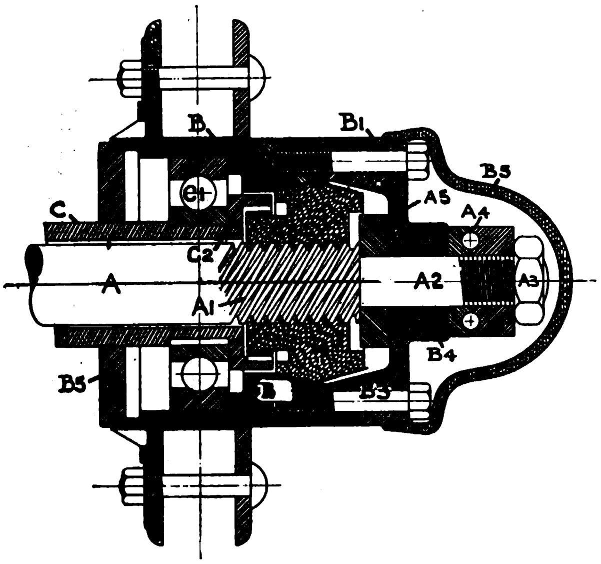


Fig. 3.—The Hedgeland Free-wheel Hub.—Sectional drawing showing the arrangement of the various members, and illustrating how the Nut, D, is held by the Friction Band, C³.

There is one other point which should be mentioned here among the pros and cons of the solid live-axle. It refers to the position of the foot-brake, and the use of the engine as a brake. With a solid live-axle, with which, of course, free-wheel clutches must be used, a car automatically begins to "coast" down a hill, consequently neither the engine nor a brake on the driving mechanism is normally available for use. Both can conceivably, as a matter of fact, be brought into operation by special manipulation, but in practice these brakes would be inadmissible on non-differential cars. This may possibly be regarded as a disadvantage by motorists who have become prejudiced by custom, especially by those who favour using the engine as a brake; on the other hand, it would compel makers to put two good brakes on the hubs of the wheels, and that is, after all, their correct position.

Principles of Action.

Hitherto solid live-axles, although possessed of greater simplicity and strength, have only been employed by makers who have been turning out cars in which low cost is the prime consideration, and even these have, in most cases, been subsequently abandoned. Free-wheel clutches, which are necessary adjuncts to this type of axle, did not give general satisfaction; some of them were noisy, and as it was difficult to ensure that more than one pawl element was taking the load, a very small member of the mechanism was thus often unduly stressed. The greatest objection, however, was the difficulty of obtaining an automatic reverse. Free-wheel clutches only work in one direction, and it is not desirable that a second set of them should have to be brought into alternative operation by hand every time it is necessary for the car to go backwards. These were among the causes that put solid live-axle cars in the background in favour of the differential, which has since been exempt from serious criticism because well established in public favour.

Silence, uniformity of grip, and an automatic reverse action are characteristic features of the Hedgeland free-wheel hub mechanism, which thus overcomes the principal difficulties enumerated above as having hitherto been peculiar to such devices. Simplicity is another feature, as our illustrations show. There is, it is true, a similarity in the details of construction—although an important distinction in the application of the principle—between this device and certain free-wheel bicycle hubs, of which the Green and Houk (Fig. 4) is an example. In the bicycle hub, however, no reverse is required, and the back-pedalling action is merely used to apply a brake, whereas in the present case the design of the hub is such that the wheel can be actually driven in either direction.

Our Illustrations.

Our illustrations show a sectional drawing of a hub, and also photographs of a model constructed to illustrate the principle of the mechanism. Only one end of the axle is illustrated, but a similar device is of course contained within each hub. On each end of the solid live-axle, A, is a coarse worm, A¹, the threads being cut right and left-handed at each end respectively, and riding on the screw is a nut, D, which has a double-cone surface. Surrounding the nut, D, with a very slight clearance, is the hub, B, which also has corresponding internal conical surfaces, B² and B³. If the nut, D, were screwed up tight so that one of its cone faces engaged with the cone, B², then the axle would be coupled to the hub in such a way that it could

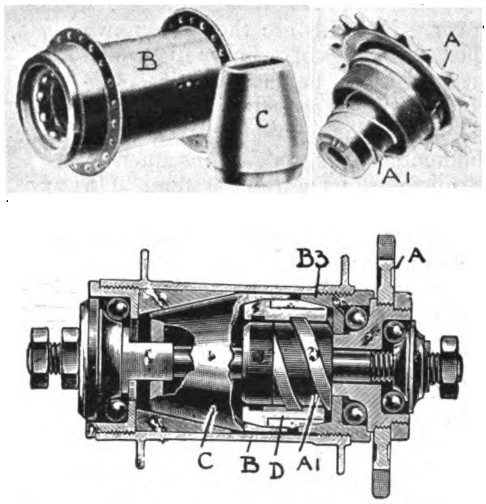


Fig. 4.—The Green and Houk Bicycle Hub.—Views showing the construction of a well-known type of bicycle hub which is somewhat similar to the Hedgeland Free-wheel, but differs in the application of the principle, because back-pedalling only applies a brake, and does not actually reverse the direction of the drive.

drive the car in one direction—say forwards. It will be noticed that the permanency of the coupling between axle and hub depends, however, on the screw, A^1, keeping the nut, D, hard up against the cone, B^2. Should this nut slack back, the drive would instantly cease to be transmitted. There are three causes which would produce slackness ; a reversal of motion, or a reduction of relative speed of the shaft, A, or an increase in the relative speed of the wheel to the driving-shaft. Of these, the first cause would, of course, be premeditated on the part of the driver, and its final effect would be merely to screw the nut, D, against the other cone, B^3, so that the car could be driven backwards. Increase in the speed of the road-wheel, on the other hand, takes place automatically, and may be the result of descending a hill or of steering the car over a curved path, which necessitates the outer wheel revolving faster than the inner wheel. Under either of these circumstances, the wheel merely releases the nut, D, from its jamb against the cone, B^2, and the drive is not again taken up until the speeds of the two members are once more equal. The same operation can, of course, take place in the reverse direction also, as for instance when the car is being driven round a corner, or is coasting, backwards.

Details of Construction.

Such is the principle of the invention and a description of its main members. As with all such devices, however, the details of construction form one of the most interesting features, because of the numerous little difficulties which they have been designed to overcome. For instance, there is no inherent tendency for the nut to travel up or down the thread merely because the shaft happens to be revolving, and if the clutch were let in to start the car while the nut were quite clear of both cones on the hub, the axle might go on revolving indefinitely without driving the car. Obviously, therefore, the nut must be held in such a way that it always tends to move along the thread directly the axle commences to revolve. This is accomplished by the friction band, C^3, which presses with the required degree of friction upon the nut, and is anchored by the ring, C^2, to the axle casing, C. The friction introduced by this little brake is inappreciable as an item in the transmission losses, but it is, nevertheless, just enough to hold the nut steady while the screw on the axle is moving it into engagement with one or other of the cones on the hub. Another important function is performed by the thrust-collars, A^4 and A^5, which receive the end pressure of the nut, D. This end pressure is obviously very great, for it is that which enables the power to be transmitted through the surfaces which are in nothing but frictional contact. When driving forward, the nut, D, tends to draw the entire hub inwards ; when reversing it tends to force the wheel off the axle-casing altogether. These forces are resisted by the thrust-collars already mentioned, which tie the hub to the axle itself, so far as any relative longitudinal motion is concerned. On the forward drive, the hub comes hard up against the plain thrust-collar, A^5—thus putting the axle in compression—but when reversing, it presses against the ball thrust-bearing, A^4—thus introducing a tension strain in the axle. This latter thrust-collar is of the ball-bearing type, in order to prevent the nut, A^3, which holds the wheel in place, from seizing against the hub when the latter is running free.

Lubrication is, of course, a very important point, and every precaution has been taken to render this effective. It will be noticed that the conical faces of the nut, D, are profusely grooved with oil ways. In addition to this, hard wood plugs, D^1, are driven into these surfaces at intervals in order to provide a safe resting place—an effective trap—for any small particles of grit which, if present, would otherwise " score " the friction surfaces.

Although the clutch members in this device are of the simple friction type, they do not slip when taking up the load, owing to the method by which they are operated. The nut and the hub are forced together quite tightly, and a certain percentage of the total driving torque is always employed in keeping them in contact, although it is the conical surface which plays the more important part in the prevention of slip. The thread on the axle has an angle of 30 deg. Consequently there is always an end thrust on the nut, which is equivalent to the bulk of the driving torque at the circumference of the axle.

So long as the axle is driving the wheel there is no friction—apart from that of the band, C^3—because everything revolves *en bloc.* When the wheel overruns the axle it releases the nut from actual pressure, although the two surfaces remain in slight contact while the axle itself revolves. Two actions take place under these conditions ; the relative motion of the axle to the casing is constantly trying to tighten up the nut, whereas the relative motion of the wheel to the axle is perpetually loosening it. These two actions neutralise one another, so that the nut stays in actual contact with the hub but does not press upon it. It is only when the axle itself ceases to rotate that the nut can remain in a neutral position quite clear of the hub. Similarly with the thrust-bearings, A^4 and A^5, these are not under pressure when the wheel is free.

Table of Reference Letters to the Hedgeland Axle.

A	Axle.
A^1	Screw thread on A.
A^2	Spigot end supporting A.
A^3	Nut holding B in place.
A^4, A^5,	Thrust collars.
B	Hub.
B^1	Outer half of B.
B^2, B^3,	Cone faces on B.
B^4	Bearing for A^2.
B^5	Dust caps.
C	Axle casing.
C^1	Ball race for B.
C^2	Nut securing C^1.
C^3	Friction brake anchoring D to C.
D	Clutch nut.
D^1	Wooden plugs.

* * * *

Earl Russell's Appeal.

LORD RUSSELL was unfortunate in his appeal to the Quarter Sessions at Kingston on Friday of last week, but if he was unfortunate in the result, some interesting evidence was brought forward. Sergeant Jarrett does not often give testimony in favour of a motorist, but on this occasion he was a witness, and Lord Russell extracted from him that his car, A1, which number—although originally allotted to a Napier car, now graces an 18-h.p. White car—was exceedingly well-known on the Ripley Road, that he had often seen it being driven near Ripley, and that he had never known it comporting itself to the common danger. In spite of this evidence from the enemy's camp, however, the fine of £15 imposed by the magistrates in the Court below was *not* remitted, though Lord Russell made a pertinacious and ingenious defence, and was as usual distinctly entertaining, particularly in cross-examination.

THE HUMBER PETROL CARS.

FOUR AND SIX-CYLINDER MODELS.

(*Continued from page* 416.)

The Foot-Brake.

SURROUNDING that universal-joint which lies immediately behind the gear-box, is a foot-brake. On the 16–20-h.p. car this brake is of the internal-expanding type, but on the 30–40-h p. model an external brake has been fitted instead. This latter is shown in Fig. 13; it is of the locomotive type, and has two hinged shoes operated by a toggle-lever in the usual way. Another portion of the drum is used for a ratchet-sprag, but this is not visible in our illustration. Another foot-brake is fitted on the back-axle of the car, but it has already been referred to when dealing with the other rear-brakes.

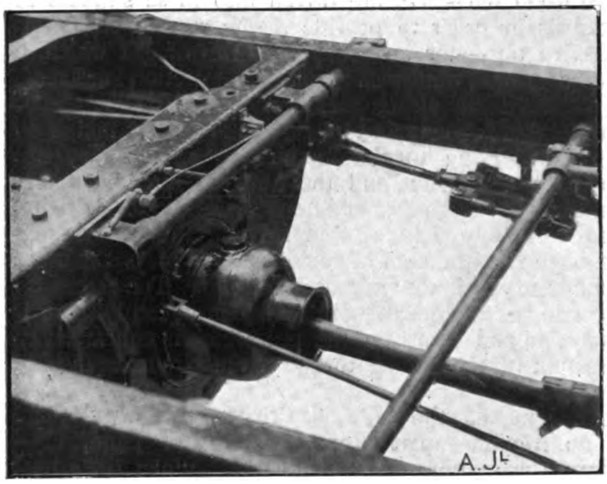


Fig. 13.—The 30–40-h.p. Humber Car. View of the foot-brake behind the gear-box on the 6-cylinder model. This is of the locomotive type with renewable cast-iron shoes, but on the 16–20-h.p. car it is an internal expanding brake similar to those on the rear wheels.

The Clutch.

Simple leather-faced cone clutches are fitted to both the 16–20-h.p. and the 30–40-h.p. models. On the 6-cylinder car, however, a special dash-pot apparatus is included in the operating mechanism for making the action of the clutch more gradual. A view of the clutch and the fly-wheel, shown separately, is given in Fig. 14, and a sectional drawing appears in Fig. 15, but the clutch is also shown in place on a 6-cylinder chassis in Fig. 16. It is on this latter view, too, that the dash-pot in the operating mechanism is illustrated. The clutch is quite self-contained, and no end pressure is imposed on the shafts when it is engaged. There are three separate springs for holding the clutch "in" instead of only one, as is usually the case. These three springs, P^1, are spaced equidistantly around the shaft, and they press directly against the aluminium inner member, P. The arrangement of the springs is most clearly illustrated by Fig. 14, but the manner in which they are retained in place, and also the way in which they operate, can be better understood from the line drawing in Fig. 15. Passing through each spring, and also through holes in the member, P, are bolts, P^2, which carry nuts at their outer ends, and are rigidly attached to a ring, P^3, at their inner ends. This ring floats on the fly-wheel boss, and a ball-thrust-bearing is arranged between it and a corresponding collar (as shown in Fig. 15) in order to enable it to revolve independently, when the clutch is "out," without introducing undue friction. By tightening up the nuts on the outer ends of the bolts, P^2, the pressure of the springs can be altered, and as the nuts

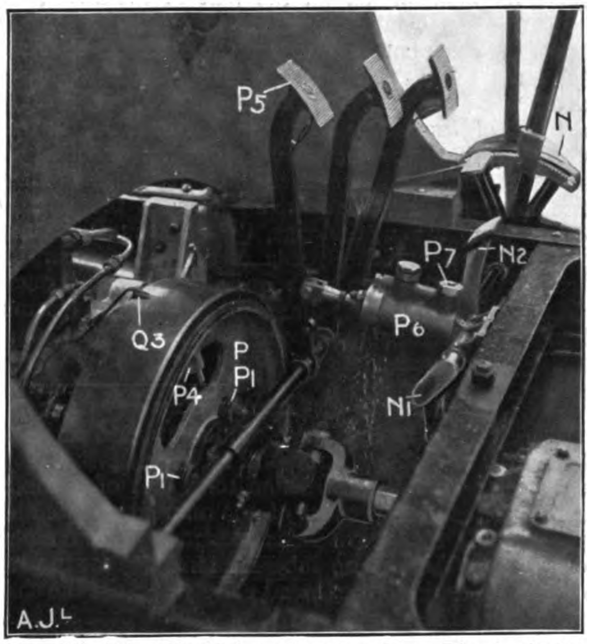


Fig. 16.—The 30–40-h.p. Humber Car. View of the clutch mechanism, showing the dash-pot, P^6, and the adjustment, P^4, for the springs under the clutch leather.

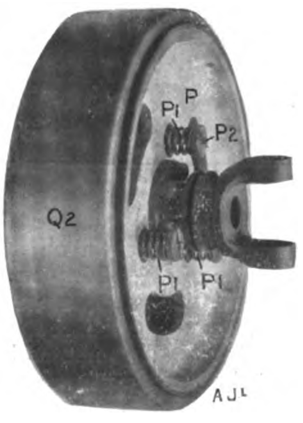


Fig. 14.—The 16–20-h.p. Humber Car. View of the clutch, showing the three clutch springs, P^1.

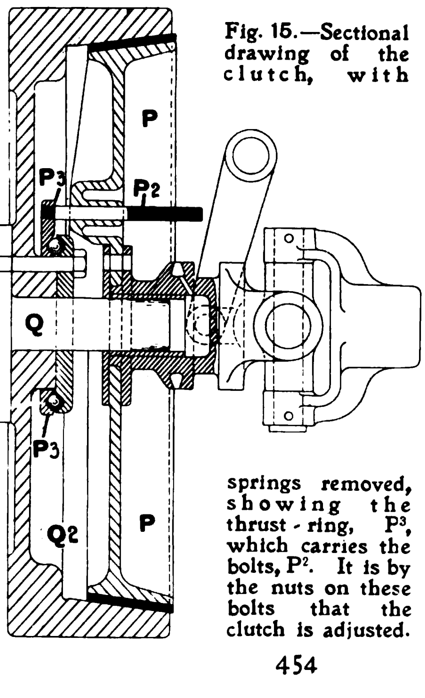


Fig. 15.—Sectional drawing of the clutch, with springs removed, showing the thrust-ring, P^3, which carries the bolts, P^2. It is by the nuts on these bolts that the clutch is adjusted.

all lie outside, there is no excuse for not always keeping the clutch in proper adjustment.

Referring now to the modifications on the clutch fitted to the 6-cylinder car, these are clearly shown in Fig. 16. There is the dash-pot, P^6, already mentioned, and also another detail in the form of adjustable springs, P^4, under the clutch leather. Springs under the clutch leather are, of course, no novelty in themselves, but there are comparatively few instances in which they are made adjustable. The action of the dash-pot, P^6, is extremely simple, and it merely forms a supplementary fitting which could be equally well attached to any existing car. Fastened to the clutch pedal, P^5, is the plunger of a small oil-pump, P^6, the cylinder of which is hinged to the frame. As the pedal is pressed forward, the piston is drawn outwards and displaces the oil—with which the pump-chamber is filled—through a by-pass to the other end of the cylinder. The valve, P^7, through which this oil flows is of the "non-return" type, and, consequently, when the pedal is released, the oil cannot flow back again the same way that it came. Instead, it has to pass through a very small hole in the piston itself, and it is the resistance of this narrow passage which causes the clutch to go "in" gently.

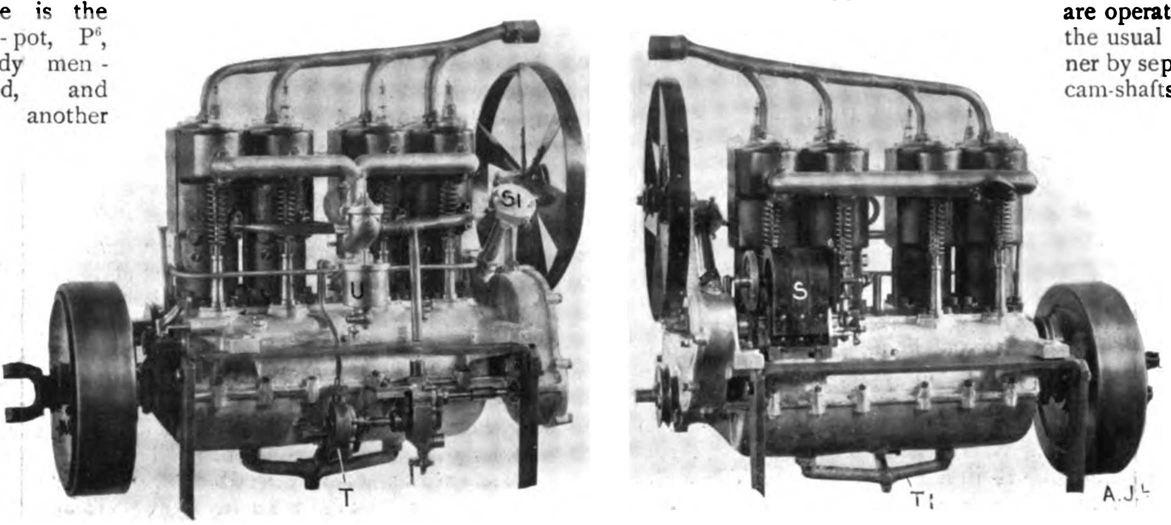


Fig. 17.—The 16-20-h.p. Humber Car. Views of the 4-cylinder engine, showing, on the left, the arrangement of the commutator, carburettor, and pumps, and, on the right, the position of the magneto.

A useful addition on the 6-cylinder car is a pointer, Q^3, for indicating the position of the crank-shaft by means of a scale marked on the periphery of the fly-wheel. The pointer indicates the dead centres, the marks on the fly-wheel corresponding with the setting of the various cranks.

The Engine.

Each cylinder on both the four and six-cylinder engine, is cast separately and is in one piece with its water-jacket and valve-pockets. In order to more easily clean out the sand from the castings, the cylinder-jackets are left open at the sides and are ultimately closed by flat brass plates. This construction is very clearly shown in Fig. 19 which represents a sectional drawing of the 4-cylinder engine. Similar construction is followed in the 6-cylinder model, except that the cylinders are placed equal distances apart and a bearing, Q^1, is arranged for the crank-shaft, Q, between each of the cylinders. The crank-shafts for the four and six-cylinder engines are shown separately in Fig. 21. It will be noticed that, on the larger shaft, the 1st and 6th, 2nd and 5th, 3rd and 4th cranks are in line. The order of firing is 1, 4, 2, 6, 3, 5. The valves are arranged symmetrically on opposite sides of the cylinders, and are operated in the usual manner by separate cam-shafts and vertical push-rods. Tapered cams are cut on the inlet cam-shaft in order to provide a variable lift of the valves by sliding the shaft. It is by this means alone that the power of the engine is controlled; there is no throttle-valve, but the ignition is timed by hand.

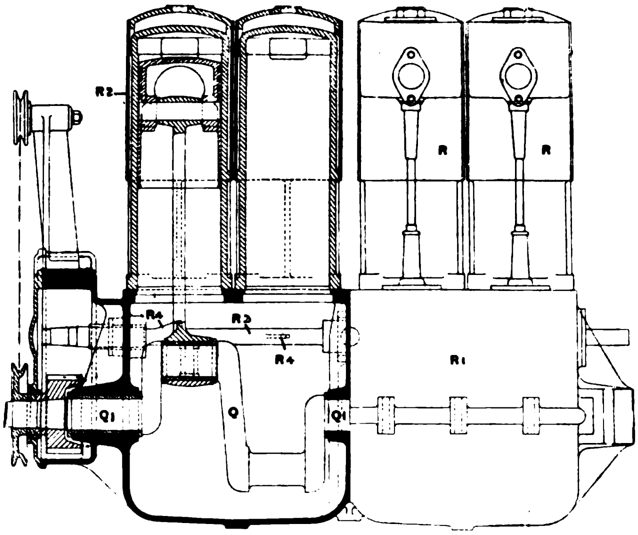


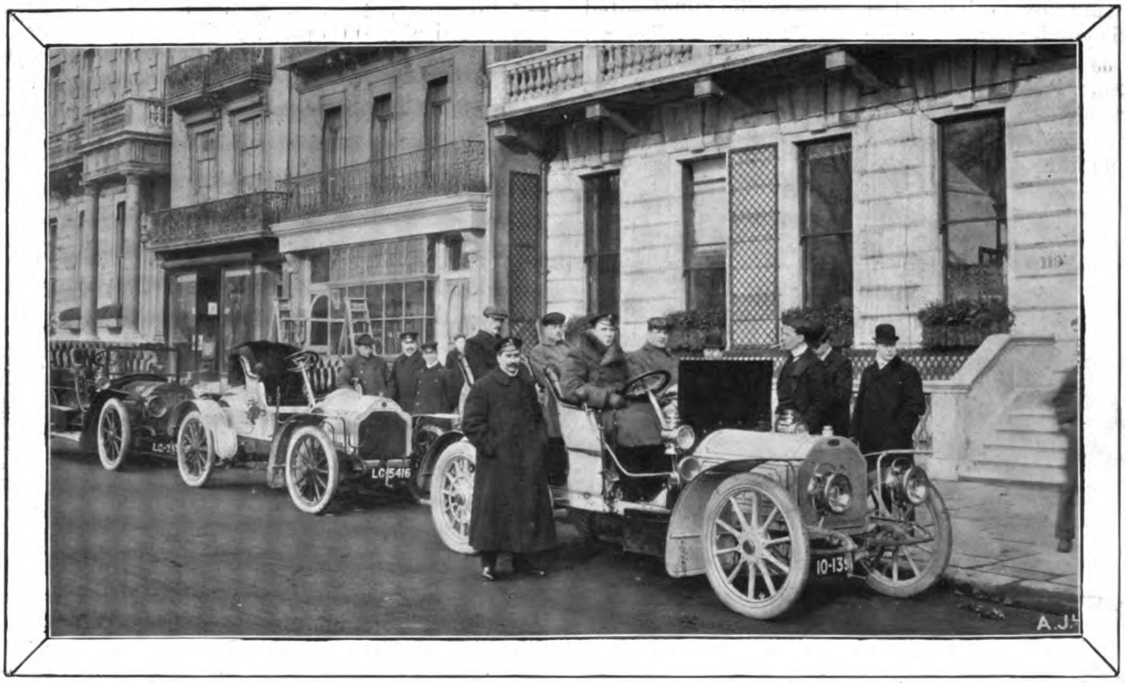
Fig. 18.—The 16-20-h.p. Humber Car. Sectional drawing showing the construction of the 4-cylinder engine.

The Ignition.

Two systems of ignition are provided, high-tension magneto and battery. An Eisemann magneto is employed in both the 4 and 6-cylinder models. It is carried on a bracket which forms part of the crank-chamber-casting, and is driven by gearing from the cam-shaft gear-wheels which lie in front of the engine. On the Eisemann magneto is a high-tension distributor, and this is also employed in connection with the battery system.

(*To be concluded.*)

RACES, RECORDS, AND TRIALS.



LONDON TO MONTE CARLO BY MOTOR CAR UNDER 40 HOURS.—Mr. Charles Jarrott about to start, accompanied by Mr. Filson Young, from outside the Automobile Club at 119, Piccadilly, on Thursday morning of last week, for Monte Carlo on his 40-h.p. Crossley car. Mr. Jarrott accomplished the distance in the remarkable time of 37½ hours, including crossing the Channel, and upon two occasions losing his way for a considerable time.

Hill Climb at Gilnahirk, co. Down.

An open hill climb, under the auspices of the Ulster Centre of the Motor Cycle Union of Ireland, took place on Saturday. The venue, Gilnahirk Hill, co. Down, was in capital order, the weather fine, and the attendance well up to the average. The programme included an event open to cars. The following are the results:—

Motor Cars.

	Mins.	Secs.
1. T. Dunlop, 5-h.p. Peugeot	1	33⅖
2. W. McCommond, 15-h.p. Darracq ...	1	39⅕
3. J. S. Garrett, 8-h.p. Rover	1	42⅖
4. T. Clapham, 5-h.p. Cottereau	1	44⅖
5. S. P. Corry, 10-h.p. Humber... ...	1	51
6. J. B. Ferguson, 10-h.p. Speedwell ...	1	51⅗
7. W. H. Green, 8-h.p. Rover	2	10

Motor Cycles.

	Mins.	Secs.
1. A. Parker, 2¾-h.p. Minerva	1	15⅖
2. H. Ferguson, 3½-h.p. Riley	1	4⅕
3. C. Rea, 3½-h.p. Minerva	1	5⅕

London to Monte Carlo in 37½ Hours by Motor Car.

Nearly everybody will have followed with interest the account of Mr. Charles Jarrott's sensational drive right through from London to Monte Carlo. The total distance is roughly about 1,000 miles, and Mr. Jarrott decided on attempting to accomplish it in 48 hours, and, except for crossing the Channel by boat, drive direct through. He got under way on Thursday morning last week at the Automobile Club premises and drove straight away down the Old Kent Road, through Eltham and Wrotham, on to Folkestone, to which town he made good, but not excessive, time. The cross-Channel journey was satisfactory and without incident, and the Customs formalities were got through as quickly as possible. Then Mr. Jarrott allowed his 40-h.p. Crossley to show its paces, arriving ultimately in Monte Carlo in 37½ hours. In the following letter, received in London on Monday from Mr. Jarrott, he describes his remarkable drive to the Riviera as follows:—

> "You will be very pleased to hear that I have arrived here in the—to my mind—remarkable time of exactly 37½ hours, after my actual start from the Automobile Club in London. It would be impossible to do the journey in the time if one had the slightest trouble with the car. As it was, my Crossley went through like a dream, and ran like a racing car. As you may guess, I did not spare it in the slightest degree even on the roughest roads. I cannot give enough praise to the car. The engine ran continuously for over 31½ hours. Our run to Folkestone was uneventful. They got the car on board very quickly, and we had a good passage over. Captain Stevens, the representative of the South Eastern at Boulogne, gave his personal assistance, and we were landed and through the Customs by two o'clock, and off we went. We made grand running at first for 2½ hours, and then my guide—whom I picked up at Boulogne—went astray, and after Beauvais lost his road and took me over miles of the worst pavé I have ever driven on. I could not go more than 10 miles an hour, and I lost an hour over this, and did not get away from Pontoise before seven. It was then dark and raining hard, and it rained for hours. My acetylene lamps gave a lot of trouble, and it was terribly hard work to keep going at top speed. The car, however, did not give us a moment's anxiety, and I had petrol waiting for me at the various towns on the road during the night, and six o'clock in the morning saw us at Dijon. From there right on to Lyons we made fine time, the rain having ceased, and when I wired you from Lyons I expected to arrive here in 40 hours, provided things went well. From Lyons to Valence, on to Orange and Avignon the roads improved, and we travelled along at a great pace, and by the time it was again dark we had got to Frejus. The last piece over the Esterelles was very trying, the twists and turns of the mountain road making it hard work, and then on we went through Cannes and Nice to Monte Carlo. It was one of the most successful drives

I have ever made. I had an idea that I was taking on a large task, and should have been delighted if I had succeeded in getting through in the 48 hours, but 37½ hours will require an awful lot of beating on an ordinary touring car. Remembering the shocking roads over a portion of the journey, the rain, our losing our way three times during the night—we went nearly 100 kilometres wrong altogether—and you must realise that it was a *great* drive.

"Regarding myself, as you may guess, I drove right through and was at the steering wheel from London to Folkestone, and then from Boulogne to Monte Carlo, 900 odd miles, and for over 31 hours, and you may be sure I was tired when I finished. I could have gone through another night but should have been rather sorry. It was not the actual time, but the fact that I was pushing along all the time that made me tired. Imagine a race for over 30 hours, and then you have the style of driving.

"My Continental non-skid tyres were a great success. Nothing happened of any kind, and they are in magnificent condition—hardly marked—and considering the way in which I smashed the car over everything, I think they are extraordinary.

"As you know, Benoist fixed up our food *en route*, and we had cold cutlets in aspic, and carved chicken, and fruit, chocolate, &c., so of course we did not stop for food at all."

Altogether Mr. Jarrott's drive was a tremendously plucky feat of endurance, and would have done up many another driver, but no one will be surprised to learn that Mr. Jarrott after twelve hours' sleep was as fresh and fit as ever.

A.C.G.B.I. Water-Consumption Test of a 6-Cylinder Napier Car.

THE following is the official certificate and report of a very satisfactory test which was conducted on Thursday of last week, under official supervision, with the object of demonstrating the suitability of high-powered 6-cylinder Napier cars for regular use in large towns or among congested traffic:—

This is to certify that a 6-cylinder 40-h.p. live-axle Napier car, weighing, without passengers, 3,107 lbs., and carrying four passengers, weighing collectively 694 lbs., ran for six hours continuously in traffic over routes selected by the club, and under the observation of officials appointed by the club, with a view to ascertaining whether the temperature of the water in the cooling system would rise to boiling point or not. The consumption of petrol per hour was also to be noted, as well as the number of occasions on which it might be necessary to change from the third or highest gear.

The temperature of the water as it came from the engine and also of the atmosphere was taken every 15 minutes, with the result that the range of the former was found to be between 100 and 165 deg. Fahr., while that of the atmosphere varied from 59 to 64 deg. Fahr. At the conclusion of the run it was found that the loss of water was not measurable. The water system was then emptied and found to contain approximately 7½ gallons.

The amount of petrol used was measured, the consumption for the six hours' run being 7 gallons 3 pints, equivalent to 1 gallon 1·84 pints per hour.

The car was driven on top gear throughout, with the exception that a change was made on the steepest part of Savoy Hill on two of the five occasions on which the hill was climbed; this was due, in each case, to the car being brought almost to a standstill by traffic, as when the road was clear the car mounted the hill without difficulty. The steepest gradient on this hill is 1 in 11·24.

The engine was stopped momentarily in traffic on five occasions during the day.

The ratio of engine to road wheels on top gear was 3·3 to 1.

The route was from the club, over Westminster Bridge, over London Bridge, then eastwards to Aldgate High Street, then *viâ* Bishopsgate and Mansion House to Newgate Street, then *viâ* Ludgate Circus, Trafalgar Square, and the Haymarket to the club; this distance was covered five times, the time occupied on the circuits varying from 64 to 76 minutes.

French Grand Prix.

THE difficulty of the level crossing at St. Calais, the only one on the course, has now been got over, as Mons. Beaugey, the Director of the French State Railways, has arranged to stop all railway traffic over the crossing during the period that the race is in progress. Any vestige of a chance of the drivers obtaining a momentary relief from the strain of driving continuously, owing to this level crossing, has thus been eliminated.

Ormond-Daytona Results.

FROM New York it is reported that a protest has been lodged by the British Club in connection with some of the results of this meeting, on the ground that the rules of the American Automobile Association were not fully complied with, in regard to differential-gears. The particular protest is stated to be against the Darracq racer, the claim being that the 6-cylinder Napier should have been declared the victor under the circumstances. The A.A.A., it is reported, in their reply state that the Napier car, by reason of a heavy compressed-air tank which, the Association say, was put in place after the machine had been weighed, made the British car over racing weight.

Circuit Européen.

THE latest entries announced are two Chenard-Walcker cars, bringing the total up to twenty-three. Entries for this event at single fees close on April 20th. Cars, however, can be entered up to July 15th at double rates.

Herkomer Cup.

AMONGST the entries which have been received for this big Continental Tourist Car Test is a 60-h.p. Benz car, by Prince Henry of Prussia.

An American Test.

IT has been decided by the A.C. of America to organise, about May next, a "Two Gallon Efficiency and Distance Test." They offer a gold and a silver cup, besides certificates of efficiency.

AERONAUTICS.

Aero Club Meetings.

FOR the coming season, a number of ascents, all to be made from the Crystal Palace, are announced by the club. The first was last Saturday, April 7th, and the subsequent dates arranged are April 21st, 28th, May 5th, 12th, 19th, 26th, June 14th, 23rd, 28th, July 5th, 12th, 21st, 28th. The ascents on each day commence at 2.30 p.m.

Balloon Handicap.

A RATHER amusing balloon race took place between a balloon of the Aero Club under the charge of Mr. C. F. Pollock, and carrying as passengers Mr. Frank Butler and Mr. A. F. Pedley, which started from the Crystal Palace on Saturday, and Mr. C. S. Rolls' new balloon, which had been constructed by Messrs. Gaudron, and which left the Wandsworth Gas Works 40 mins. subsequently. Owing to the direction of the wind, the balloon from the Crystal Palace was thus allowed 40 mins. start, but just when the race was becoming quite exciting it was found that the Aero Club balloon was short of ballast, and had to descend near the Guards' Polo Ground at Wimbledon. Mr. Rolls' balloon kept aloft for some two hours, and ultimately descended in Bulstrode Park, near Beaconsfield. It maintained a regular altitude of 500 ft. throughout the run, and a constant conversation was carried on between the aeronauts and the inhabitants of the villages they passed over. Many of them, thinking the balloon about to descend, ran for long distances after it, but finally had to abandon the chase from sheer exhaustion. When the balloon touched earth in Bulstrode Park, several of the household of Sir John Ramsden, the proprietor, were treated to captive ascents, the balloon being let up by the trail ropes.

MOTOR BOATING.

Monaco Motor Boat Meeting.

Racing by the cruisers and speed craft commenced on Sunday last, following the trial spins which most of the boats, exhibited at the Exhibition, had indulged in on the Friday and Saturday. During the early part of the week bad weather had prevailed, and as a result of the rough sea, "Fiat XIV" broke from her moorings one night and was completely wrecked on the shore, only her engines being saved to tell the tale. Mr. Lionel de Rothschild's Siola showed good form, in spite of the damage she sustained *en route* to France, and the other British racer, Yarrow-Napier, was sufficiently repaired to warrant her owners letting her once more take the water on Sunday, when she made some very satisfactory times in her trial runs.

Better starting arrangements had been made this year, whereby the previous complaints of uncertainty when to get away for each race have been satisfactorily met. The first of the racing commenced at 10.30 a.m. on Sunday, when the little 6½-metre cruisers (max. cylinder capacity, 2½ litres) were despatched over a 50-kilom. course. For this 16 boats lined up, but at the finish only 6 were officially timed to a finish, Mr. Miall Green's fine boat, Takumono, taking second place. The order of classing was as follows :—

	H.	M.	S.
1. Mendelssohn (4-cyl. Mutel motor) ...	2	1	3⅕
2. Takumono (Blake motor)	2	28	6⅕
3. Nautilus-Mutel (Mutel motor) ...	2	38	8
4. Fleur d'Helice (Tony Huber motor)	2	41	57⅕
5. Muguette (Filtz motor)	3	1	18
6. Poum (Filtz motor)	3	44	10

In the Racing Section there were four starters in the 8-metre class—distance 50 kiloms. These were Antoinette IV, La Rapière II, Seasick, and Vol-au-vent. Only the two first got through, their times being:—
1. Antoinette (Levavasseur motor), 1h. 9m. 23s.; 2. La Rapière II (Panhard Motor), 1h. 11m. 55⅕s.

On Monday the 6½ to 8-metre cruisers (max. cylinder cap., 3¾ litres), were raced in the morning, the afternoon event being reserved for the very important 8 to 12-metre racing class, in which were included the Yarrow-Napier, Siola, Fiat XIII, Mercedes-Paris, and Martini III. Again the distance for both was over 50 kiloms.

This day's racing provided a British victory, Yarrow-Napier running in the 12-metre class in 2 hrs. 41 secs. for the 50 kiloms. Only three boats came up to the line—Yarrow-Napier, Martini III, and Siola—but Fiat XIII eventually took part after arriving late on the course. Lord Montagu was at the helm of Yarrow-Napier, which got away first, and was the first boat to finish. Trouble was experienced in starting the Siola engine, in consequence of a broken starting chain, and this occasioned considerable delay. Afterwards the mechanic, Thompson, was washed overboard, and the successful rescue still further hindered the boat's progress, and the race was abandoned on the fourth round.

Fiat XIII was the only other boat to finish, her time being 2h. 32m. Although Yarrow-Napier's speed was only 15½ miles per hour, it must not be overlooked that a very heavy sea was running, and the mere capability of the boat to finish at all is highly creditable.

When the cruiser section should have started in the morning, the sea was so choppy that it was questioned whether the boats should be allowed to race, and the actual start took place somewhat later than the schedule time. Only two of the eight starters completed the course. Excelsior VIII was first and Janus II second, their times being 2h. 19m. 36s. and 3h. 13m., respectively.

MONACO MOTOR BOAT MEETING.—General view of the boats on Exhibition.

CLUBS AND ASSOCIATIONS.

Aero Club Exhibition.

THE judges have made the following awards in connection with the recent exhibition at the Agricultural Hall, Islington :—

Aero Club First Prize.—Short Bros., for "excellence of construction."

Medals.—Messrs. Negretti and Zambra, Joseph Levi and Company, A. Gaudron, F. H. Butler, Sir David Salomons, E. Vauden Driepche.

Among those who paid lengthy visits of inspection to the Exhibition were Lord Armstrong, Sir William Goff, Col. Templer (Aldershot), Col. Capper (head of the Balloon Section, Aldershot), Sir Hiram Maxim, Lord Llangattock, Sir Dudley Duckworth King, Bart., and Lord Vaux, of Harrowden.

Automobile Association.

CONSIDERABLE energy is being infused into the work of the Association in assisting their members to avoid unpleasant "incidents" with the police. In carrying out their new system of only looking after their members and not automobilists indiscriminately, a private badge code has been established, whereby members instantly know when passing a scout what the state of affairs is likely to be ahead, the colours of the badge displayed by the scouts giving a clue to the action of the police.

The Association write us appealing for contributions towards their library in the shape of maps and road books, in order that they may cope with the rapid expansion of their cyclist organisation. The Association hope that henceforth they may be listed to receive motoring publications through the courtesy of the authors, to enable them to carry on the good work which they have in the past so generously dispensed to motorists one and all.

Automobile Co-Operative Association, Ltd.

AT an inaugural luncheon held last Monday the scheme which is being launched under the above title was explained by the organisers. The idea of the Association is that members should co-operate in the purchase of motor cars, accessories, and supplies, and have the benefit of repair shops upon co-operative terms. The Association has been incorporated under the Industrial and Provident Societies Acts, and it is stated that no shareholder will be allowed to hold more than 200 shares. The revenue will be constituted by discounts and commissions granted to the Association, plus subscriptions, and all profits are to be divided between the members of the Association *pro rata* to their share holdings. A register of recommended motor servants is to be kept, members' cars sold or exchanged, district correspondents are to be appointed, but it is specified that the trading department of the Association will be conducted only for the service and benefit of the members, business not being solicited in the ordinary way, and it is claimed that the new undertaking is not in any way to be run in opposition to existing firms, but rather the reverse. Arrangements, it is stated, have been made for the building for the Association of a 25-h.p. 6-cylinder car, which is to be known as the "Mayfair" car.

Membership is obtainable by subscribing for a £1 ordinary share and a payment of 5*s.* annually, whilst subscribers of 25 ordinary shares will be entitled to one founders' share of the value of 1*s.* It is proposed to divide the profits of the Association in the proportion of two-thirds to ordinary shareholders and one-third to founder shareholders. The offices are at 1, Albemarle Street, and the Committee of Management is constituted as follows: Mr. John Walker, M.I.C.E. ; Col. S. Melville Jopp ; Mr. Jules de Meray ; and Mr. J. M. Campion, M.I C.E.

British Empire Motor Trades Alliance, Limited.

THE following firms have recently been elected to membership :—Brotherhood-Crocker Motors, Limited ; Clement-Talbot, Limited ; St. Pancras Ironwork Company, Limited ; Smith Parfrey and Company, Limited.

Coventry Motor Club.

AT the annual general meeting held last week it was decided to change the title of the club to the above, and to include drivers of cars as well as motor cyclists, and also to hold open competitions, for which two Cups have already been presented to be won outright. Mr. E. W. Walford was elected secretary for the coming year.

On Saturday, 31st ult., the opening run was to Stratford-on-Avon, about twenty members and friends attending. For Easter Sunday and Monday, a run has been organised to the Royal Hotel, Droitwich, and the following other fixtures have been arranged :—

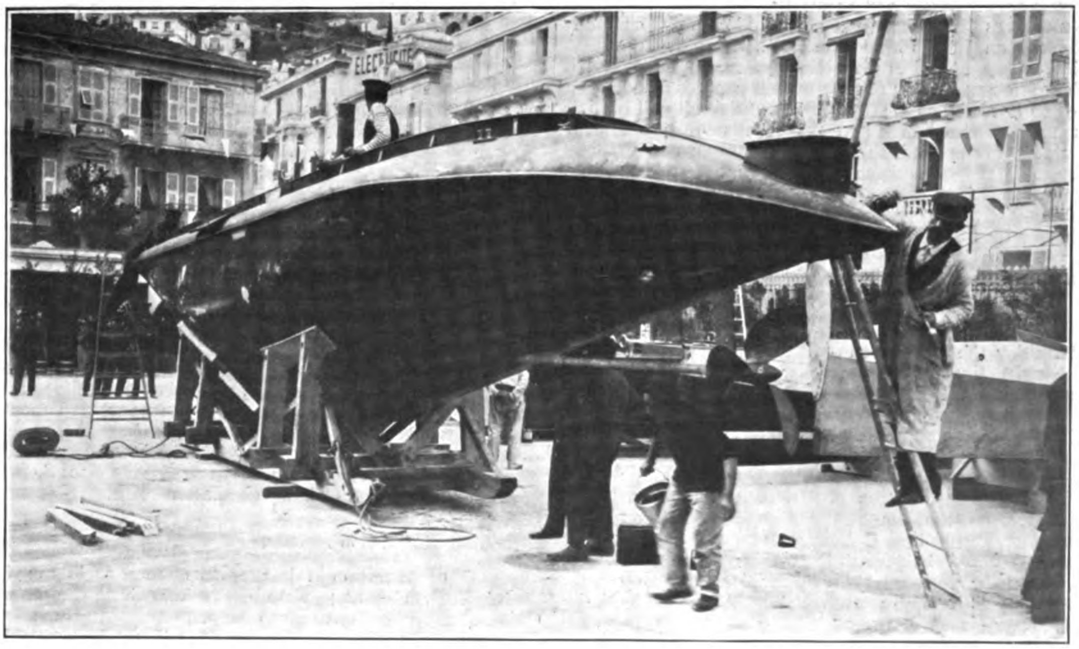
April 21st.—To Chipping Campden *via* Halford and Ilmington Hill to inspect the hill, with a view to a hill-climbing competition later in the season.

May 5th and 6th.—To Clarendon Hotel, Oxford, to meet the Essex Club.

May 19th.—To Fromes Hill to meet the Hereford Club.

Essex County A.C.

FOR the first run of this recently formed club, the County town of Chelmsford was selected as the venue, when a good number of the members drove down on their cars, a very successful



MONACO MOTOR BOAT MEETING.—Finishing touches to "Mercedes W.D.," one of the most strikingly designed boats in the Exhibition.

meet resulting, the local arrangements being in the hands of the hon. secretary of the Chelmsford district, Mr. T. Clarkson. The members lunched together at the White Hart Hotel, Mr. Burnett Tabrum, chairman of the club, presiding. The club now numbers 80 members, and already a programme has been arranged for the coming season, including May 5th, a hill climb and brake tests; May 27th, a run to Dunmow; June 9th, a gymkhana; June 23rd, meet and speed judgment tests; July 8th, a run to Maldon.

Mr. G. C. Tijou, who had undertaken the duties of honorary secretary, has been compelled to resign his position owing to ill-health. Mr. F. Lindus Forge has been appointed hon. secretary in his place.

Hertfordshire A.C.

The club is organising an Open Hill-Climbing Competition or motor cycles on Maple Hill, on Saturday, 21st April. Entry forms will be supplied on application to the Secretary.

Motor Union Defence Fund.

Lord Iveagh has shown in practical form his appreciation of the work of the Motor Union by making a contribution of £10 to its Defence Fund, an example to be followed by all good motorists. The demands upon the Union Defence Fund are heavy and continuous. The extent to which the Union is able to grant financial assistance in legal cases is, of course, dependent upon the manner in which automobilists contribute to this fund. During the last few days grants amounting to over £120 have been made from the fund. These include (1) £30 towards the expenses of an appeal against the decision of a High Court jury in a civil case in which heavy damages were awarded against a member. (2) A grant of £20 towards the cost of a successful application to the High Court on Wednesday last to quash a conviction on the grounds of bias and prejudice on the part of the magistrates. (3) A grant towards the expenses of a member of the Union who had successfully defended a charge brought against him of driving to the danger of the public. (4) A grant towards the cost of the Local Government Board inquiry into the application of the Harrogate Town Council for a ten-mile speed limit. (5) Expenses of an appeal against the conviction of a member by the magistrates at Stevenage for allowing the index marks of the car to become indistinguishable when it was shown that all reasonable precautions had been taken by the driver.

Motor Van, Wagon, and Omnibus Users' Association.

The officers of the Association have been re-appointed as follows:—Chairman, Col. R. E. Crompton, C.B., M.I.C.E.; hon. treasurer, E. Shrapnell Smith; solicitor, T. W. Staplee Firth; secretary, W. Rees Jeffreys.

North-Eastern Automobile Association.

Arrangements have been made for a hill-climbing competition, to take place on June 16th. The hill selected is known as Ragpath Side, about 2½ miles from Lanchester, in the west of Durham. The steepest portion of the gradient consists of a length of 60 yards of 1 in 4¾, and as the total length of the hill will be half a mile, it is expected that some interesting results will be obtained.

A special feature of the hill is the separate return route for cars that have ascended the hill, which will greatly facilitate the safe control of the competition. The whole of the hill is visible from start to finish, and as there is very little traffic on the road, it is exceptionally suitable for the purpose of the competition.

The competition being closed, will be open only to cars either driven or owned by members of the Association.

Nottinghamshire A.C.

Last Saturday the opening run of the season was to Barnby Moor. The chief fixtures for the other summer arrangements of the club are announced as follows:—

April 28th. — Inter-club Meet, Ashby-de-la-Zouch; meeting Leicestershire, Wolverhampton, Northamptonshire, Midland and Derbyshire Automobile Clubs.

May 5th.—Car Trials and Race for Wilson Challenge Cup; 19th, Moor Court, Oakamoor, invitation of Mr. F. A. Bolton, including hill-climb; 24th, Club Run, Southwell; 26th, Motor Union Meet, Birmingham; 31st, Picnic Tea, Dukeries.

June 16th. — Inter-Club Meet, Lichfield; meeting Wolverhampton A.C.; 28th, Non-stop Run, Foster Challenge Cup.

July 7th.—Club Hill-climb; 12th, Club Meet, Ashby-de-la-Zouch; 21st, Motor Union, Bath; 26th, Bulwell Hall, by invitation of President (Mr. C. Hardy).

August.—Cole-Orton Hall, invitation of Mr. F. A. Smith.

September.—Skegness Races; 22nd, Motor Union Meet, York.

Sheffield and District A.C.

The following fixtures have been arranged:—To-day (Saturday), meet at Doncaster Railway Station Yard at 4 p.m., for run to Askern Hydro; Easter Monday, April 16th, 1906, meet at the Town Hall, at 10.30 a.m., for Barnby Moor, "Ye Olde Bell." Motor Union Inter-Club Meets.—In connection with the provincial meetings of the general committee of the Motor Union, a special run to Birmingham is being arranged on May 26th.

Society of Motor Manufacturers and Traders.

The first meeting of the Carriage Builders' Section of the Society was held on April 3rd, Mr. A. F. Mulliner, President of the Institute of British Carriage Builders, in the chair, when a draft memorial, received through the London Chamber of Commerce, on the subject of railway rates was considered. A committee of the section was formed as follows:—Messrs. Arthur F. Mulliner (Mulliner's Carriage Building and Motor Company, Ltd.), R. G. Alford (Alford and Alder), H. J. Mulliner (H. J. Mulliner), P. B. Liversidge (Liversidge and Son, Ltd.), F. Goodchild (Lacre Motor Car Co., Ltd.), Oliver Thorn (W. and F. Thorn), and J. Hassett (Laurie and Marner, Ltd.). This committee has power to add to its number, and as there are now many carriage builders in the Society, it will shortly be increased.

A meeting of motor cab proprietors was held on April 4th, when there were present:—Messrs. H. W. Hodges, C. Windham-Quin, R. G Bailey, Godfrey C. Isaacs (in the chair), V. L. D. Parry, and S. Michaels. The proposed new regulations of the police were considered and observations on the same formulated. A meeting of makers interested was convened for Monday, after which the views of makers and users are to be placed before the Chief Commissioner, it is hoped, with as satisfactory results as in the case of motor omnibuses.

A select committee having been appointed by the House of Commons to inquire into matters affecting cabs and omnibuses in the metropolis, the Society is preparing evidence to lay before the committee. As by the close of this year, it is stated, about one-half of the horsed omnibus service will have been transformed into motor 'buses, and by the end of next year, the transformation will be fairly complete, and as, moreover, the change in the cab service, although at present delayed by causes which will be placed before this committee, is likely to be equally rapid as soon as the difficulties in question can be removed, these are matters which essentially affect the motor trade. It is therefore to be hoped that the Society will be well represented before the committee.

Amongst matters before the Committee of Management of the Society last Thursday were patent law amendment and the Merchandise Marks Act.

Recent new members of the Society are:—Aries, Limited; Argylls, London, Limited; Berliet; Brown, David and Sons (Huddersfield), Limited; Commercial Press, Limited; Lancashire Steam Motor Company, Limited; Mann and Overtons, Limited; Smith, S. and Son; West, Limited.

Yorkshire A.C.

About the middle of the year, it is proposed to again hold a race meeting on Filey sands.

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MOTOR CYCLING.

Southern Motor Club Hill Climb.

Sixty competitors participated in the hill climb at Coast Hill, Westcott, near Dorking, last Saturday, when the weather was such as likely to attract a big field, in addition to the roads being in splendid condition. The hill, which is ⅝ of a mile in length, has an average gradient of 1 in 10. The entries included about 26 tri-cars, the rest being motor bicycles. The winner in the motor bicycle section was R. M. Bryce on a 3½-h.p. Brown, W. W. Green with a 2¾-h.p. Eland, being second. In the tri-car class S. S. Hickson on a 4-h.p. air-cooled C.I.E. secured first place.

International Cup Race.

The alteration in date for this motor cycle race in Austria to July 8th has been agreed to by the Auto Cycle Club, and the British eliminating trials will probably take place in June over a private course, as the Isle of Man circuit will not be available, in consequence of the Tourist Trophy Race having been postponed until September.

THE DESIGN AND CONSTRUCTION OF HIGH SPEED MOTOR BOATS.*

By James A. Smith.

Although the high-speed motor boat has claimed a considerable amount of attention during the last two years, it is of very recent introduction, if we except the high-speed steam launches and the early torpedo boats of twenty to thirty years ago.

This paper concerns itself mainly with the modern types of high-speed launches which have been rendered possible by the developments in internal combustion motors since the present century opened.

The first serious attempt to produce a high-speed motor launch in this country was made by Mr. S. F. Edge in 1902. This highly-successful boat was designed by Mr. Linton Hope, and represented an important advance on anything previously attempted, a speed of 19 knots being attained in fairly smooth water, with 66 rated motor power. At the same time a large development in high-speed motor launches took place in France, although no boats of any note were produced there until 1903, when Mr. Thubron's "Trèfle-à-Quatre" was built; she was 33 ft. long, and had a motor of 85 h.p. These two boats proved what could be done, and since then the development has been very great.

The length of the high-powered racing classes has been practically fixed at 40 ft., or 12 metres in the case of French boats, this length being limited by European racing facilities. The beam and freeboard have naturally been reduced as much as possible, but it has been found that for powers over 100 h.p. a minimum beam of about 5 ft., or 8 beams in the length, is necessary to provide sufficient stability under helm, and to give sufficiency of bearing aft. With the object of saving weight, many of the racing boats have had their freeboard reduced to an unwise extent, but the small advantage in displacement gained thereby does not at all compensate for the discomfort and danger entailed.

In the beginning the Marine Motor Association assumed that the Restricted Classes should be specially legislated for, so as to encourage healthy and safe types of boats, and it was rightly thought that the kind of boat required for the many duties of a yacht's launch or tender was the type which ought to be developed. Their Restricted Classes were therefore described as "yachts' launches," and a maximum beam-length ratio was fixed, varying from 3·4 for the smallest classes to 5·2 for boats 30 ft. in length, the minimum freeboard being fixed at 25 per cent. of the minimum beam. Within these limits safe and comfortable boats can be designed, which may be depended upon to possess sufficient stability and reserve of buoyancy even in a heavy seaway. With the object of putting a premium on displacement, and indirectly on scantlings, the Association devised a rating rule in which boats of heavy build gain a considerable advantage when racing under time allowance, and high powers are not favoured. More recent legislation restricts the power of these boats to 3·5 h.p. per ton (Thames measurement).

The following are particulars of two representative boats built to this rule, before the power restriction came into force, and it is also to be noted that both these boats are within the limits of the French restrictions:—

	"Takumono."	"Quicksilver."
Length overall	21 ft. 4 in.	30 ft. 0 in.
Breadth over planking	4 ft. 10 in.	5 ft. 10 in.
Draught amidships	11 in.	11 in.
Draught extreme at propeller ...	1 ft. 8 in.	2 ft. 0 in.
Motor power by M.M.A. Rule ...	12·6	39
Weight of hull department complete	800 lbs.	1,500 lbs.
Weight of machinery department complete, tank full	590 lbs.	1,300 lbs.
Area of midship section	2·72 sq. ft.	3·06 sq. ft.
Speed, light, with crew only ...	12·8 knots	18·2 knots
Revolutions	1,000	900
Load at Rule freeboard, deadweight	830 lbs.	600 lbs.
Load displacement	0·99 tons.	1·52 tons

Fig. 1.

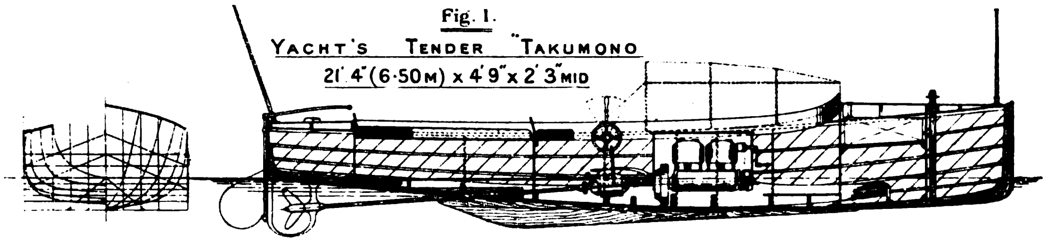

Yacht's Tender "Takumono"
21' 4" (6·50m) x 4' 9" x 2' 3" mid

Fig. 2.

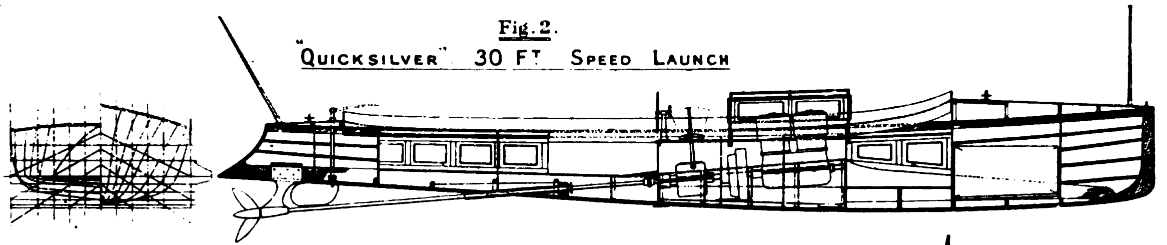
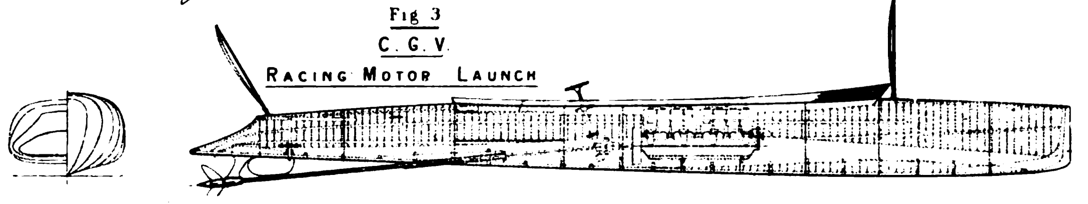

"Quicksilver" 30 Ft Speed Launch

Fig 3


C. G. V.
Racing Motor Launch

The rules adopted by the various foreign governing bodies for restricted or "cruising" boats have been designed with the same object in view, and there are now many hundreds of such boats in actual use.

Soon after the introduction of the internal combustion motor, the speed-length ratio rose very rapidly, and a short experience was sufficient to prove that the ordinary ship form was unsuitable. The difference between the water pressures on the fore and after bodies caused such launches to trim so much by the stern when under way that they were not only uncomfortable but dangerous, consequently the plan was adopted of cutting away all the deadwood aft, and leaving the run of a practically flat section. In many cases this flattening and widening of the after-body sections has been carried to extremes, probably as the result of some confusion between the causes and effects of high speeds. This form of after-body is common to nearly all high-speed motor launches, and for such vessels it has been proved to be satisfactory for sea work, providing as it does a large amount of surface and initial stability, and tending to counteract the "throw-over" of the screw in a narrow beam boat of high power. It has also been found that a boat of this form, in the case of a break-down of machinery, behaves well in the trough of a sea, keeping practically normal to the wave-surface owing to its flat form and light displacement, and that it ships very little water, provided it is left to find its own conditions.

The amount of flat bearing surface required to prevent excessive change of trim need not be considered until the ratio of speed to $\sqrt{\text{length}}$ exceeds unity. The ratio in high-speed motor launches is usually in the vicinity of 3, sometimes exceeding 4, and here a minimum bearing surface of about 40 per cent. of the area of the load-water plane should be provided. Generally speaking, the form of this bearing surface is of more importance than its extent, as boats which have been designed for one power have afterwards had their motors replaced by others more than twice as powerful without showing excessive change of trim under way. Other forms of run have been tried, varying between a V section and a tunnelled section, but the former, unless carefully wrought out, tends to produce a boat which will heel considerably when the helm is put over, while the latter, although it permits the shaft to be fitted with less rake, is apt to interfere seriously with the free run of the stream lines.

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* Excerpts from a paper read before the Institute of Naval Architects on April 5, 1906.

Many forms of midship section have been tried, including sections of an almost triangular shape, flat sections with slightly rounded bilges, and sections of an elliptical form. As the midship section affects the form of the lines in a great part of both bodies, and as the skin friction must be reduced as much as possible, a section should be made approximating to that giving the least wetted surface, and the form now generally adopted is that of an ellipse V-d slightly towards the keel. This form lends itself to a good type both of after-body and fore-body, permits of an easy angle of entrance of the water lines, and of a suitable form of sectional area curve. Perhaps the best example of this form of midship section is that of "Trèfle-à-Quatre." As to the fore-body, some designers have recommended that it should be made up of sharp V sections, forming with the after-body the double wedge or "all entrance and all run" form of lines. This form is good in theory, but does not work well in practice, as a short high powered boat built strictly on these lines would bury itself too much when among waves, and it is also difficult to see what would be lost by cutting off the whole of the deep forefoot, thereby lessening the wetted surface, and avoiding panting and vibration forward; when this is done the theoretical double wedge no longer exists.

Fig 4.

MOTOR LAUNCH NAPIER II

LENGTH 40FT BEAM 5FT DEPTH 2FT 6IN

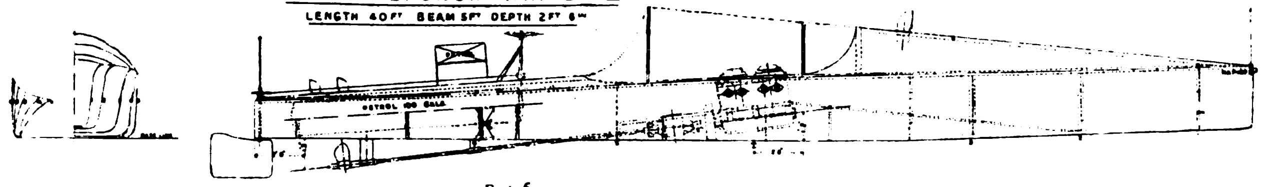
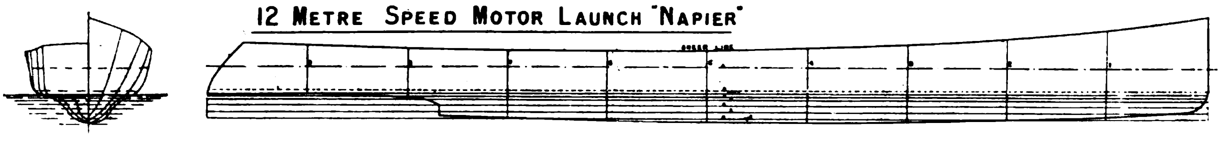


Fig 5

12 METRE SPEED MOTOR LAUNCH "NAPIER"



Shallow U-shaped sections forward have been frequently used, giving good results in the matter of speed, but they tend to break the water into fine spray a short distance from the stem, which, coming inboard, renders the boat uncomfortable. A suitable form of fore body is produced by the adoption of a compromise between the very sharp V section and the U section.

The form of sectional area curve is not of great moment in ordinary well-designed boats; for those who prefer it a curve of versed sines and trochoids will give as good results as any other.

The shape of the boat above the water line is largely a matter of individual taste, and with the light scantlings usually employed, it is possible to form the upper body, and particularly the stern, into almost any desired form.

Other forms of under-water body have been tried, including straight-line boats with perfectly flat bottoms, which are easy to build, but possess no other advantages. In "Napier II.," designed and built by Messrs. Yarrow, a new form of hull has been adopted consisting of an after-body of usual form, a flat midship section with slightly rounded bilges, and an inclined plane forward from about a third of the length from the stem, meeting the water line at the stem; the object being to cause the fore part of the boat to lift out of the water, and thereby lessen the skin and wave resistances. Very satisfactory speed results have been obtained from this boat, and a second boat of similar design, "Yarrow-Napier," has been built.

The particulars of "Napier II." are as follows:—Length overall, 40 ft.; beam extreme, 5 ft.; draught amidships, 9 in.; weight of hull department complete, 3,300 lbs.; weight of machinery department complete, tank full; 3,400 lbs.; total displacement with crew of 3, 3·19 tons; motor power by M.M.A. Rule, 146. Following on the experience gained with "Napier II." Messrs. Yarrow have just completed a 60 ft. second-class torpedo boat, "1176," built of steel, and fitted with five 75-h.p. Yarrow-Napier motors. A form of underwater body similar to that of "Napier II." and "Yarrows Napier" has been adopted, and the boat travels very lightly over the water, with very little wave resistance.

The sheer draught of "Napier," a 12-metre launch, built by Messrs. Saunders last year, illustrates a type of underwater body designed on exactly opposite lines to the Yarrow boats. The fore body consists of V sections, passing into a midship section with a hollow bilge, the hollow increasing aft of midships until at about one-fourth of the length from the stern the vertical underwater body disappears, leaving flat sections aft of this of the usual motor boat form. The after part of the vertical body, therefore, appears not unlike one of the built-out shaft bosses of a twin-screw steamer. Very fine entrance lines are obtained; and, although the boat has more wetted surface than one of usual form, she has very little wave-making resistance. Constructional advantages are also gained, the long motor-bearers being dispensed with, while the shaft may be fitted almost horizontal.

Some of the earlier motor boats, including "Napier I." and "Napier II.," were built of steel, but it has been found that steel is an unsuitable material for light high-powered boats under 50 ft. in length. The chief disadvantages are, first, the difficulty of obtaining a fair surface, which is of great importance in this type of boat, and, secondly, the difficulty of making satisfactory joints in the thin material which has to be employed. Considerations of weight and expense tend also largely in favour of wood in the construction of such boats. The weight of hull of "Napier II." was 1·47 tons for 140 h.p., but a similar hull of a suitable wood construction need not have weighed more than 10 cwt. complete. For such light boats, wood has many advantages over steel for resisting local stresses, and is also on a level with steel for resisting structural stresses. The systems of wood construction commonly adopted are: (1) Ordinary carvel planking with cut or bent timbers. (2) Double skin without timbers for small boats, and with timbers for larger boats or for higher powers. (3) Treble skin with or without timbers. The first method (planks and timbers) is safe to employ where weights need not be greatly cut down, and it is also the cheapest. The second system (double skin) is that most commonly employed for high-powered boats, and gives satisfactory results in every way. For light, fast launches up to 25 ft. in length timbers need not be used, and in boats of greater length, or with higher powers, bent timbering may be introduced with advantage. "C.G.V.", a racing launch of 130-h.p., is an example of this method of building, the details being: Length overall, 11·99 metres (39 ft. 4 in.); breadth extreme over planking, 5 ft.; depth amidships to coaming, 3 ft. 6 in.; draught amidships, 8 in.; draught extreme at propeller, 2 ft. 3 in.; displacement, total, 1·7 tons; weight of hull department complete, 750 lbs.; weight of machinery department complete, tank full, 2,700 lbs.; load of designed water-line, 350 lbs. The third system (treble skin) is more expensive, without corresponding advantages. Saunders' sewn system is also largely adopted for speed launches. By this method two, three, four, and occasionally five skins of very light veneer are sewn together with copper wire, producing a form of skin which is exceedingly strong, and which may also be built to forms which are almost impossible by any other system.

It will be noticed that in most of the high-powered launches the requisite longitudinal strength is chiefly obtained by extending the solid wood girders carrying the machinery over a great part, or the whole, of the length of the boat. An extension of this idea has been recently devised according to which the skin or shell of the vessel is not required to contribute directly to the structural strength, the engine girders being constructed to form, in conjunction with one or more other members and suitable transverse framing, a complete framework in themselves. This method lends itself to many adaptations for larger types of light high-speed vessels.

THE SPEED OF MOTOR BOATS AND THEIR RATING FOR RACING PURPOSES.*

By Linton Hope.

It is with considerable diffidence that I have ventured to bring before the members of this Institution a few details in connection with motor boats and their rating rules. I feel that it is at best an unimportant matter, which can only interest a few naval architects, who, like myself, have taken up this particular branch of the subject. I trust, however, in view of the great possibilities in the direction of high speeds which the use of the internal combustion engine has opened up, that I shall be pardoned for attaching some value to the data obtained from the racing of motor boats, as the results of this racing may have some influence on the design of vessels of the torpedo boat type in the future.

That motor boats are likely to be of service for naval purposes is, I think, proved by the keen interest taken in them by our most noted torpedo boat builders, Messrs. Thornycroft and Co. and Messrs. Yarrow and Co. Both of these firms have expended an enormous amount of time and money in experimenting with these craft, and have obtained highly successful results.

To show that the internal combustion engine has made it possible to obtain a great increase of speed as compared with the best results obtained from steam, I will take as an example the reputed fastest 30-ft. steam launch on record. Her power is stated to be about 110 b.h.p., her displacement 2·75 tons, and her best speed 19 knots, which is no doubt an excellent performance for a boat with lean ends and a large mid-section. On the other hand, we have a 26-ft. motor boat, "Rapière," of approximately 1·2 tons displacement and 110 b.h.p., with a speed of 25·5 knots. There is no doubt that the latter boat was a far superior design for high speeds, and she obtained an increase of 34 per cent. in speed for the same power on 4 ft. less length, but with only 44 per cent. of the other's displacement. "Rapière" proved herself to be an able sea boat, and quite strong enough; while she was run by two men only, as against the three on the steam launch. She was, therefore, quite as useful as the other, and had the advantage of being much faster and lighter with a smaller crew; added to which, she was noted for her reliability and regular running. This will, I think, show that at any rate for picket-boats and such small fry, the motor boat can show a marked superiority over the steam-boat in speed, weight, and ease of handling, to say nothing of the reduction in machinery space.

I will now endeavour to show that motor-boat racing has some definite use, and that it is not a mere craze of the moment. The reason why motor-boat races are useful is that, unless a new type of engine, such as the internal combustion motor, is tried to breaking point in races, its development would be a matter of many years, and, even then, it is a question whether anything would find out the weak spots of design and construction so thoroughly as the strain and keen competition of racing. It may be said that a racing motor boat is only a flimsy affair, just strong enough to hold together for a race or two; but this paring away of every superfluous ounce of weight, while it may make that particular boat too short-lived for commercial purposes, does more to teach the engineer the exact stresses and strains which are to be reckoned with than years of ordinary running with a big margin of safety. The same arguments apply to the design and construction of the hulls, as the following examples will show :—

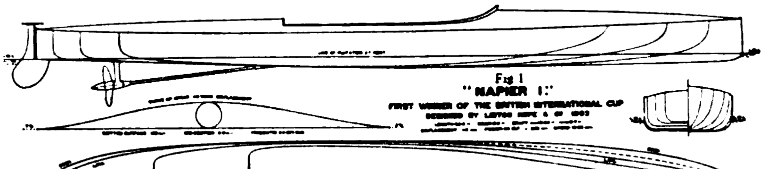


Fig 1
"NAPIER I."
FIRST WINNER OF THE BRITISH INTERNATIONAL CUP
DESIGNED BY LINTON HOPE & Co 1903

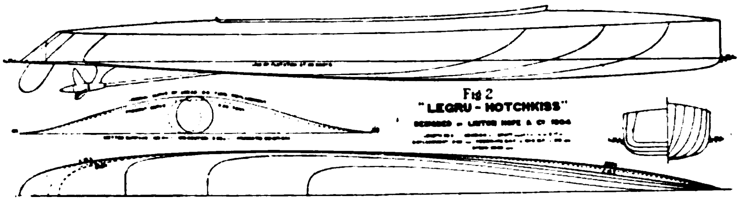


Fig 2
"LEGRU - HOTCHKISS"
DESIGNED BY LINTON HOPE & Co 1904

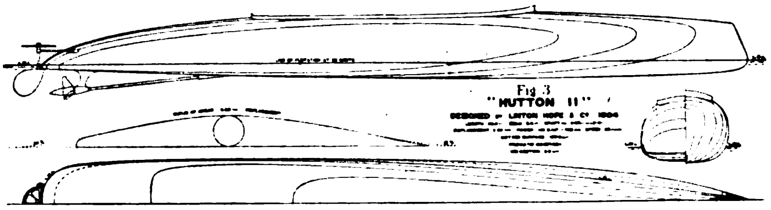


Fig 3
"HUTTON II"
DESIGNED BY LINTON HOPE & Co 1904

"Napier I." (1903).

This boat was one of the pioneers of the present racing motor boats in this country, for she was the first 40-ft. racer ever built in England. The year 1903 saw the inauguration of motor boat races in Great Britain with the first race for the Harmsworth Cup at Queenstown, and it was to defend this Cup that I was commissioned to design "Napier I." The Cup race itself lost a great deal of its interest owing to the breakdown of the only foreign competitor just before the start, and to the fact that the other two British boats, "Scolopendra" and "Durendal," were only 30-footers, while "Napier I." was a 40-footer, with more power than either of the others, which enabled her to win easily.

On referring to the design of "Napier I.," it will be seen that she is a canoe-shaped boat so far as her deck plan and water-line are concerned, and that the latter is rather full forward compared with the later boats. She is extremely flat-bottomed and wall-sided, her mid-section being composed of three straight lines for the bottom and sides connected by quarter circles at the bilges. This form of section is carried right aft, and for some considerable distance forward, where it gradually merges into a compromise between a flattened U and a blunt V. Her present curve of sectional areas is a curve of versed sines minus 9 per cent. for the fore body, and a curve of versed sines minus 7 per cent. for the after body, the generating circle being placed at 0·51 of the overall length from the stem. She was designed for a displacement of 30 cwt., but the weights of machinery given me when designing the boat proved to be considerably under the actual weight of the complete engine and accessories, which exceeded the estimated weights by some 5 cwt. The weight of the steel hull also exceeded the estimated weights by over 1 cwt., as it was found impossible to obtain ready-made angle bars of the required size for the frames; consequently we had to do the best we could, and use frames of a total weight of about 50 per cent. more than we had intended. The frames are $\frac{3}{4}$ in. by $\frac{3}{4}$ in. by $\frac{1}{8}$ in. angles spaced 1 ft. centre to centre, instead of $\frac{1}{2}$ in. by $\frac{1}{2}$ in. by $\frac{1}{16}$ in. spaced 6 in. centre to centre, as I had specified. The plating is 20 gauge steel, with the exception of the keel plate, which is 14 gauge. No doubt, if we had succeeded in obtaining the lighter frames, and had been able to space them half the distance apart, she would have been a better boat; but, in any case, I do not think that steel can compete for a moment with wood, on the score of strength for weight, in these small boats. The main strength of the boat is in the pair of deep fore-and-aft girders which extend from end to end of the hull, carrying the motor, clutch-gear, and the thrust, and I believe she was one of the first boats to be built with the idea of utilising the engine-bearers as the main longitudinal strength of the hull in place of the ordinary keel construction. The motor is a 4-cylinder Napier of about 66 b.h.p. It ran fairly well, and, considering its very moderate power, drove the boat at a reasonably good speed. She had, I believe, a two-bladed propeller, 28 in. in diameter, during her first year's racing; but, as the propeller was fitted while I was abroad, I was never able to examine it, or to obtain any accurate details as to pitch and blade area. Her best race record is 18·88 knots over a course off Ryde, which included several sharp turns, so no doubt she actually touched a mean speed of 19 knots. Probably her best speed on a measured mile under favourable weather conditions would be about 19½ knots.

"Legru-Hotchkiss" (1903).

This boat was originally known as "Gardner-Serpollet," and was designed by me at the end of 1903 for M. Legru, of Paris, being built in his own workshops by men specially sent over by Mr. Saunders, of Goring. She was built of four thicknesses of mahogany and cedar on the well-known Saunders sewn system, and has, I believe, shown no signs of wear after two years' very rough treatment. Like "Napier I.," she has the long and deep engine bearers forming her chief longitudinal strength; but in design she varies considerably from the earlier boat, having a much finer entrance, rounder bottom, with broader and flatter sections right aft, the greatest breadth on the water line being at about 0·63 of the length from the stem, instead of 0·57, as in "Napier I." Her curve of areas as originally designed was also different, the generating circle being placed in the centre, while the after body was fuller, being a compromise between a curve of versed sines and a trochoid minus 5 per cent., the fore body being a curve of versed sines minus 7 per cent. Her present curve of areas is a curve of versed sines minus 3½ per cent. for the fore body, and a compromise between a trochoid and a curve of versed sines minus 6 per cent. for the after body; the generating circle being moved still further aft. She was designed for a displacement of 2·5 tons, and was originally fitted with a Gardner-Serpollet steam engine; this, however, proved unsatisfactory, her best speed under steam being only about 16 knots, although the engine was stated by the makers to be capable of developing anything up to three or four hundred horse-power. The steam engine was then removed with all its cumbrous accessories of generator, condenser, &c., and a pair of 4-cylinder petrol motors were installed in its place. During the early part of 1905 she did nothing much, although she showed on several occasions that she would have a good turn of speed when tuned up. However, by August last. she was in good running order, and in the Rondet Saint Trophy Race, from Trouville to Honfleur and back, she attained a mean speed of 26·58 knots, the mean revolutions of the motor being 780 per minute. The maximum brake horse-power of the two motors is 170.

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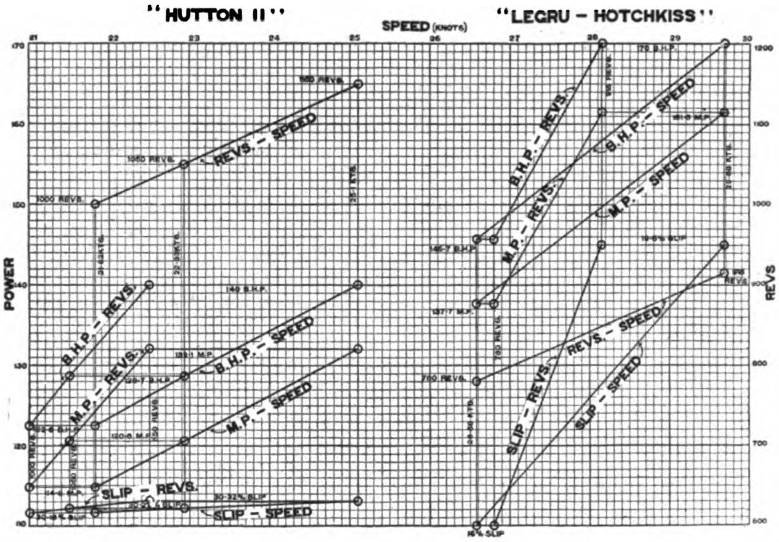
* Excerpts from a Paper read before the Institution of Naval Architects, April 5th, 1906.

FIG. 3A

CURVES OF PERFORMANCE – 40FT RACING MOTOR BOATS



In a subsequent trial on the Seine, "Legru-Hotchkiss" attained a speed of 29·68 knots over a distance of 5 nautical miles, the speed of the motor being 915 revolutions per minute. This is considerably in excess of any speed hitherto attained by motor boats, the best previous record being, I believe, 28·19 knots over one nautical mile, by the 50-ft. "Dubonnet," with 300 h.p.

In comparing these two performances of 26·58 and 29·68 knots, it should be noted that the propeller is 27½ in. in diameter, and 49-in. pitch; the slip at 26·58 knots with 780 revolutions is just under 16 per cent., while at 29·68 knots and 915 revolutions, the slip is 19½ per cent., showing an increase of over 3½ per cent. slip in three knots; whereas, in the case of a similar boat, the slip hardly varies between 22 and 25 knots. The two motors are set in tandem, and consist of 8 cylinders, of 180 mm. bore, or 39·4 sq. in. piston area, and 0·56 ft. stroke, the power under the Marine Motor Association's rule being 137·7 m.p. at 780 revolutions, and 161·5 m.p. at 915 revolutions.

"Hutton II."

In the autumn of 1903, I designed this boat for Mr. J. E. Hutton. She was designed for a pair of 140-b.h.p. motors and twin-screws; but, owing to the machinery weights having exceeded the maker's estimates, the motors were found to be much too heavy for a pair to be used, and it was therefore decided to alter the internal framing of the boat, and fit a single motor in her. She is a very strongly built boat, with single skin ribband carvel cedar planking ⅝ in. thick at the bottom, and ½ in. at the sides, with steamed timbers of rock elm ⅝ in. by ¾ in., spaced 4 in. centre to centre, bent right round under the keel, and scarped along the centre line of the deck. She had originally three lines of deep girder engine bearers extending throughout her length, of 2 in. Oregon pine, about 16 in. deep at the fore end of the motors, one of them forming the keel. When it was decided to abandon the twin motors, the deep internal keel or central engine bearer had to be cut away to within 3 ins. of the skin for some 8 ft. or so, to make room for the single motor amidships. Two short supplementary engine beds were then fitted on the oak floor frames, and connected with the main fore-and-aft girders, which were now too far apart to carry the motor. The engine was placed 3 ins. to port of the centre line of the boat, giving her a slight list, which just counterbalanced the effect of the propeller, and prevented any list to starboard when the clutch was thrown in suddenly. She has proved herself an excellent sea boat, and runs remarkably cleanly.

"Hutton II." has a 6-cylinder Hutton motor of 140 b.h.p. at 1,150 revolutions; and the diagram, Fig. 3A (Plate II.), shows her curve of brake-horse-power and revolutions at various speeds; speed and brake horse-power, speed and revolutions; motor power and speed, motor power and revolutions; slip and revolutions, and slip and speed. A similar set of curves is also shown for "Legru-Hotchkiss," and I would draw attention to the great difference in curves of slip and speed of these two boats. "Hutton II." has a totally different curve of sectional areas to either of the previous boats, the generating circle being placed further aft, viz., at 0·67 of the length. The fore body is a curve of versed sines minus 18 per cent., and the after body is a similar curve minus 34 per cent., the original length of the two being nearly the same, and their combined length equal to 54 ft.

I think the proportions of power to displacement in these examples show that internal combustion motors have great advantages over even the most modern forms of steam engine, when high speed and lightness are required in small craft; and, as all the fastest motor boats have been produced entirely through the keen competition of international racing, I think that this racing is doing useful work towards the evolution of high-speed boats.

Racing Rules.

It is obvious that, if motor boats are to race, they must have rules to race under, with a governing body to formulate the rules, and to act as a Court of Appeal in all cases of protests and disputes. Such a body already existed for sailing yachts, in the Yacht Racing Association; but, naturally, motor boats were quite out of their line; consequently, it became necessary to found a separate association on somewhat similar lines.

(*To be concluded.*)

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Liability for Skidding Accidents.

A CASE arising out of the "tendency (as Mr. De Prelle would put it) of lamp posts to come into contact with motor 'buses," was tried recently at the Wandsworth County Court, in which the London Road Car Company were sued for £9 14*s.* 9*d.* for damage done by their 'buses in this way. The omnibus company paid £5 13*s.* 6*d.* into Court, but pleaded that the damages arose owing to slide-slip on account of the greasy roads. Judge Russell, in deciding the case, said he found it impossible to consider the drivers negligent, as the damage was done by the omnibus skidding, the road being slippery and greasy through wet weather. He did not feel satisfied that putting on the brake *necessarily caused the skidding, or that it implied negligence.* He accordingly gave judgment for the defendant company.

GAS ENGINES FOR SHIP PROPULSION.*

By J. E. Thornycroft.

Since 1904, when Herr Emil Capitaine was carrying out experiments with his first boat, a number of vessels have been fitted which have shown very satisfactory results, and it is thought that a description of them, and particulars of the results obtained, will be of interest, Sir William White having recently stated that he considers the gas engine will be bound to play a most important part in marine engineering.

The majority of small gas engines work on the "Otto" cycle, and this is the only type of engine that has been as yet tried for marine work. The gas producer which is generally used for moderate powers works on what is known as the "suction" principle. The advantage of this system is that neither a steam boiler working under pressure, nor a gas container for holding the gas is required, and the further very important advantage for marine work is that there is no danger from a leakage of gas from the producer; if leakage takes place, it is from the atmosphere into the producer itself. There are many combined plants consisting of a gas engine working in conjunction with a suction producer at work for stationary purposes, but there are very many features which must be changed to adapt the gas engines and producer for boat work, the details of the apparatus all having to be specially worked out for the new conditions.

Fig. 1.

The "Dowson" Gas Plant

suction type

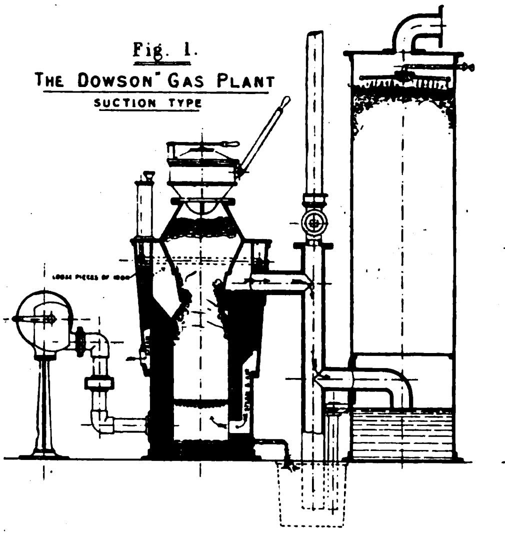
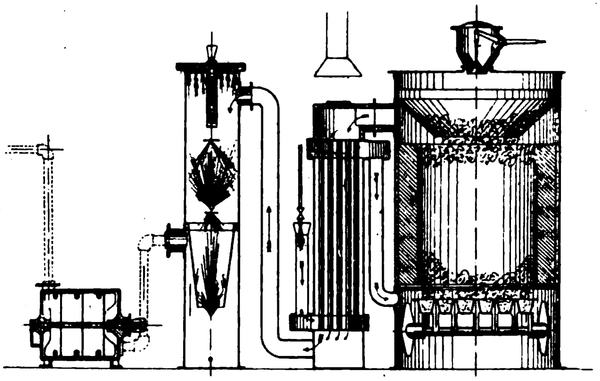


Fig 6.

The "Capitaine" Suction Gas Plant



The "Duff-Whitfield" Gas Producer

Fig. 2.

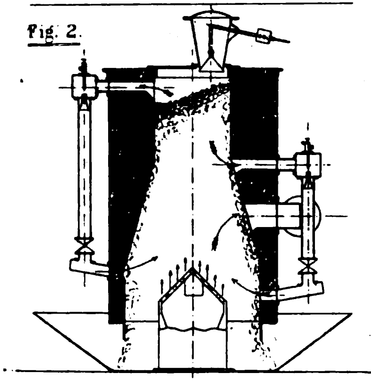


Fig. 3

The "Boutillier" Suction Gas Plant

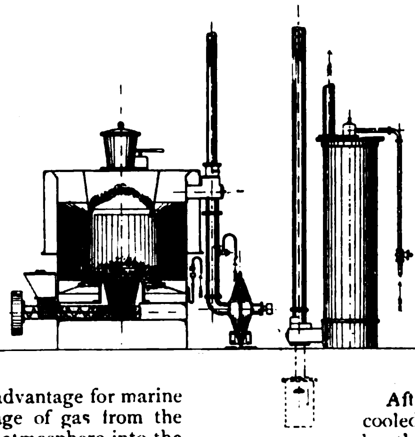
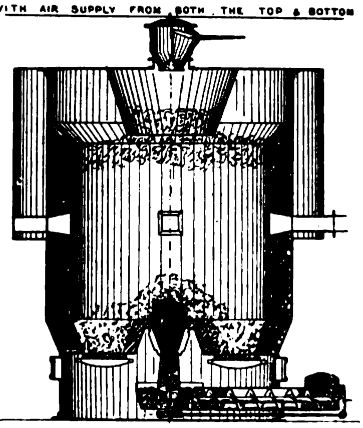


Fig. 4

Suction Gas Plant

with air supply from both the top & bottom



The producers for moderate sized powers are usually worked with anthracite coal or coke, it being too difficult to make a satisfactory small plant to work with bituminous coal. For larger powers, and for vessels that have to take up fuel at different ports, the producer must be capable of dealing with coal, other than anthracite, which may be of a tarry or caking character. The design of the producer capable of successfully dealing with bituminous or caking coal is a much more difficult problem than the anthracite producer. There are, of course, very many large land installations of pressure producers working with bituminous coal, but the apparatus for extracting the tar and other by-products, as at present arranged, is far too cumbrous for marine work, and the marine producer to deal with this class of coal must be designed on entirely different lines, being arranged to consume the tar which is evaporated off from the coal in the first stages of its heating. This has been arranged in some producers by taking the gas off at a comparatively hot part of the fire, instead of at near the top of the new coal, as is usually the case with the anthracite producer; but there are plants now at work dealing successfully with bituminous caking coal, which are fed by an undertype stoker, so that the new coal is forced into the hottest part of the fire, and the tar which is driven out is at once burned.

After the gas leaves the producer, it must be first cooled, and, even when anthracite is used, it has to be thoroughly cleaned. This is usually done by passing the gas through a series of vessels, where it is scrubbed by its passage through layers of coke over which water is running. It is frequently arranged that the cooling of the gas is effected by passing it over a water-containing vessel, which acts as a generator for the steam required by the producer; but there are disadvantages in this method where the producer is not working at a uniform load, as the steam will not be generated until the producer has been working some time, and will continue when the engine has been stopped, and when it is not required, and so cool the fire, causing the gas to be poor when the engine is again started, after the temporary stoppage has taken place.

The large space occupied by the ordinary coke scrubbers prohibits their use for marine work, and to meet this difficulty Herr Capitaine has arranged his plant to clean the gas after it has been cooled, by the introduction of a very fine spray of water, which mixes with the small particles of dust and other impurities in the gas, and forms a sort of fog; the gas in this stage is passed into a centrifugal apparatus, having a peripheral speed of 160 ft. a second, which throws out the moisture and impurities, leaving a clean dry gas to be drawn out by the engine. The composition of this gas may be taken to be about as follows: Carbon di-oxide, 6 per cent.; carbon mon-oxide, 25 per cent.; CH_4 methane, 1 per cent.; hydrogen, 14 per cent.; nitrogen, 54 per cent.

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* Excerpts from a paper read before the Institution of Naval Architects, on April 5th, 1906.

It will be realised that the size of the producer for a given power is comparatively small when it is known that the area of the fire grate necessary is only 0·05 sq. ft. per horse-power, whereas the average for an ordinary natural-draught steam boiler, burning 15 lbs. coal per square foot grate area, would be ·2 sq. ft. per horse-power. The depth of the fire will vary considerably with different qualities of coal used, but will not be usually more than two to three times the diameter of the fire grate.

Designs of Different Types of Producers.

Fig. 1 shows Messrs. Dowson's arrangement of suction producer designed for anthracite coal. The majority of the smaller suction producers will be found to closely resemble this type. A fire-brick lined steel casing is fitted with fire bars and a closed ashpit, and in the upper part of the casing a conical hopper is placed with the usual valves for opening and closing to admit fresh charges of fuel. The gases come off the fuel at the base of the conical hopper, and pass through a steam generating pipe or vessel, and then away to the cooler and scrubber. The producer is fitted with an outer casing in which the air is heated, and mixes with the steam on its way to the ashpit. Fig. 2 shows the Duff-Whitfield producer arranged for working with bituminous fuel. In this producer, the tarry products which are evaporated off from the new coal are caused to pass through the hottest part of the fire, and so are consumed before the gas passes away to the cooler. Fig. 3 shows the "Boutillier" producer arranged for working with bituminous fuel, in which the fuel is supplied by an undertype stoker to the hottest part of the fire, so that the tar is at once decomposed, and cannot pass away with the gas. The principle upon which this producer works seems to be one of the best adapted for marine work. The "Jan" producer consists of a series of producers which are arranged to work in sequence, the gases of one which has been newly charged passing through another which has been at work some time, so that there are always some of the producers supplying tarry gas, the tar being consumed by one of the other producers in the later stages of the series.

The heat losses in the producer itself are very small, as the whole plant can be so thoroughly lagged that practically there need only be heat passing away with the gas that is being generated. The loss from this cause may be very much reduced by using it to heat the air supplied to the producer. The heat efficiency, as given by Messrs. Dowson for their suction plant, is 90 per cent. As the result of a great many tests, the late Mr. Bryan Donkin gave the average heat efficiency of steam boilers at 66·7 per cent.

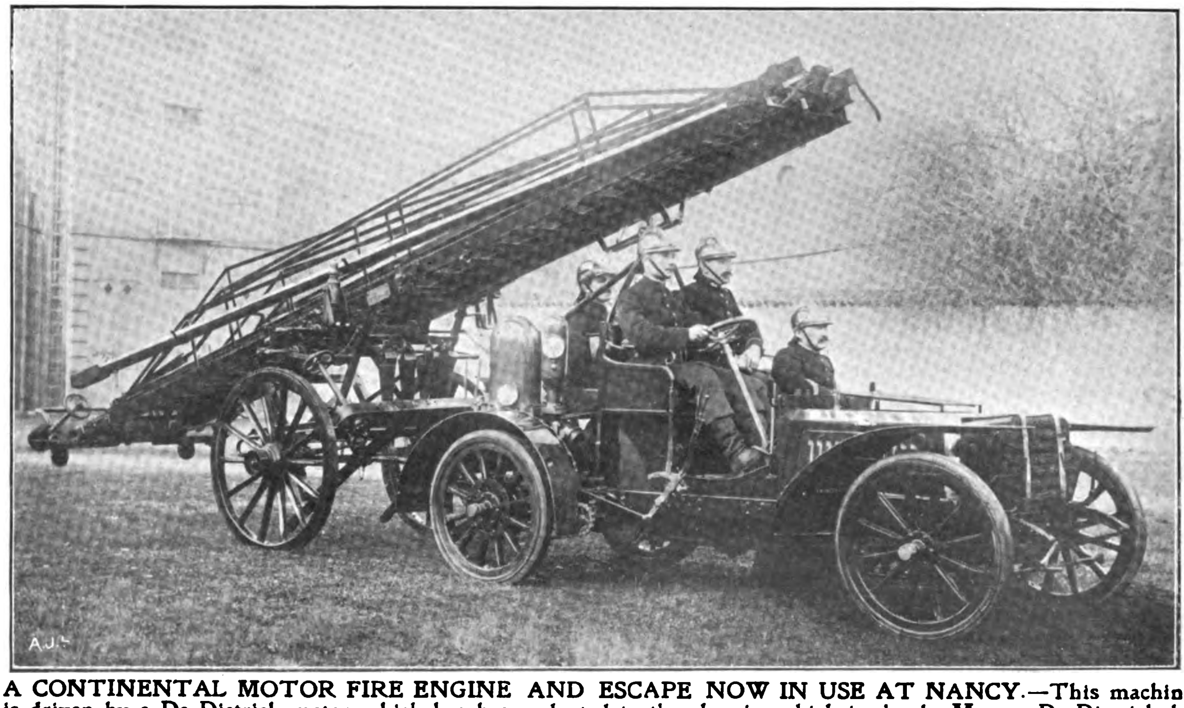
To start up the Capitaine producer (Fig. 6), a fire is lighted on the bars, and the producer is then filled with fuel, air being either drawn or blown through it by a hand or power-driven fan. For a producer of about 50 or 100 h.p., twenty to thirty minutes should be sufficient to give good gas. The gas first produced will have very little hydrogen in it, and will not be very powerful, and requires the steam generator to come into operation. The steam which is added to the air entering the producer strengthens the gas by the water being decomposed, and gives the percentage of hydrogen which is shown in the analysis above referred to. The gas produced in this way is of a comparatively slow burning nature, and may be described as poor gas, to distinguish it from town gas, and some of the other gases generated by pressure producers. There is an advantage in this slow-burning gas, as it enables the engine to work with a high compression, thus giving a larger range of expansion, and consequently a high economy. The producer will probably be giving the best gas at somewhat near its full capacity, but will continue to give good gas down to a small proportion of full load. At very light loads it is difficult to keep the fire hot enough to produce good gas, and special means have to be adopted to keep the producer hot enough on these occasions.

(*To be concluded.*)

* * * *

Motors in the Austrian Army.

THE development of automobilism in connection with the Austrian Army is engaging the serious attention of the War Office staff of that country. A course of instruction is to be organised next autumn which will be open to officers of the Army Service Department and staff officers, and the automobile is to be made considerable use of at the general manœuvres this year. The armour-plated automobile, which is at present at Wiener-Neustadt, will be also brought into use. In fact there is now not a single power which has not recognised the value of the automobile for military purposes.



A CONTINENTAL MOTOR FIRE ENGINE AND ESCAPE NOW IN USE AT NANCY.—This machine is driven by a De Dietrich motor which has been adapted to the chassis, which is also by Messrs. De Dietrich, by Messrs. Morin-Gugumus, an important firm who specially deal on the Continent with fire engines.

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

"A SCENE OF 10 YEARS AGO."

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As the driver of the car adorning your front page in this week's issue, I trust you will permit me to correct an inaccuracy in the foot-note. I refer to your suggestion that the banner in the foreground is the statutory "red flag." As a matter of fact, it was part of the insignia of a "Society of Oddfellows," and is borne by two men.

The occasion preceded the legalization of the motor vehicle, as you are aware, by a few days only, and the City Police very kindly agreed to ignore the breach of the statutes then in force. It is, however, interesting to remember that at Temple Bar names were taken by the Metropolitan Police with a view to proceedings, but I forget the result. I am inclined to think that no proceedings were taken, or alternatively, if they were taken the charge was dismissed.

I am,
Yours faithfully,
C. MCR. TURRELL.

April 5th.

DUST.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The season is at hand when observation may appropriately be directed to the annoyance caused by the dust of motor cars. Observation is of two kinds, the lazy kind whose useful result can only be an increase in the vocabulary of execration, and the intelligent form which by noting minute differences, and by suggesting intelligent hypotheses to explain them, can eventually guide us to reproduce on all cars the minimum dust-raising qualifications which may be noted on any one.

The publication and record of such observations from the largest possible number of points of view is invaluable. The motorist may observe why one road surface is less dusty than another, the pedestrian why one car is less dusty, the manufacturer may report that with the same car one type of tyre is less dusty.

If only the cause of the dust be forthcoming, all cars can within a reasonable time be brought up to the better standard. It remains with the Press to determine for itself whether invective or reason shall be allowed to predominate in the correspondence they will without doubt shortly publish. So far only generalities have been reached. We find that:—

(1) Sharp corners, and excessive road cambers, lead to slip, and, therefore, to dust.
(2) More dust is raised by cars from a rough road than from an equally dusty road, if it be smooth, for an equal speed of travelling.
(3) Watering the road moderately diminishes the dust. (It is noteworthy that many of the grumblers living by the roadside have not realised *even this.*)
(4) Tarmac is one of the best anti-dust road surfaces. Tar-macadam, the spreading of crude oil on roads, the spreading of oil emulsions in water on the road are important palliatives.
(5) Wood asphalte, cobbles and sets are not dusty save after use by horse traffic.
(6) Cars with smooth boat-shaped under surfaces are less dusty than others.
(7) Cars with flaring mudguards fitted with leather flaps near the road level are more dusty.
(8) Cars on high wheels well clear of the ground are less dusty.
(9) Cars with large tool boxes at the back reaching low down between the back wheels are dusty.
(10) Large car bodies are in some cases dustier than small ones.
(11) Blowing off the exhaust near the ground is dusty.
(12) Cars fitted with engines having an insufficient fly-wheel or an ununiform turning effort from any cause are more dusty.
(13) Cars whose chassis are mounted on very easy springs having a large up and down travel will suck up the dust with each rise and fall of the body on rough roads.
(14) Front wheels—or rolling wheels raise less dust than back wheels or driven wheels.
(15) Smooth pneumatic tyres are dusty.
(16) Solid (or pneumatic) rubber tyres are more dusty at higher speeds and with high-powered engines.
(17) Non-skid devices, such as small steel studs, &c., not only do not increase the dust but actually diminish it.

Amongst the instructive negative conclusions from experiments made by the Automobile Club, we find:—

(18) That a car fitted with two long vertical dust screens placed near the ground between the road wheels and the chassis, and extending the full length of the car edgwise to the direction of travelling (*i.e.*, arranged to prevent the dust-laden air thrown up by the road wheels from mixing with the air draught which passes underneath the car), showed no improvement from these attachments.
(19) Horizontal screens fixed so as to closely embrace the driving wheel tyres, and adjustable to various heights from the ground, were tried in the hope that they might throw back on to the road the dust-laden air raised by the wheels, and so prevent it from becoming entangled in the air eddies at the back of the car. No good result was obtained.

I need not rehearse the instructive results obtained by Lord Montagu of Beaulieu's tests on various kinds of road treatment, nor by Mr. W. R. Cooper's beautiful experiments, nor dwell upon certain minor car questions, such as avoiding the centrifugal draught due to spokes by employing disc wheels, but I would like to put in practice the suggestion of the first paragraph of this letter by putting forward a tentative explanation of the observations Nos. 1, 2, 3 and 15, 16, 17 above. The answer is contained in these words—*the differential gear.*

On a macadam road, which presents the normal number of mounds, hollows, and irregularities, it constantly occurs that one driven wheel is making good and effective contact with the road while the other is skipping lightly over those hollows which in dry weather may be called dust puddles. If the car be travelling slowly the wheel simply rolls down into the puddle and rolls out at the other side. If the wheel be heavy, and travelling fast, however, it cannot follow the profile of downward slope of the puddle, and it leaves the road following a parabolic curve. At that instant it loses all adhesion with the ground, and thereupon, owing to the peculiarity of the "differential," the wheel which has good adhesion ceases to transmit any forward effort from the engine, and the wheel which has no adhesion immediately begins to spin round at an increased rate of rotation. Under its own inertia the car continues to roll on till the skidding wheel approaches the ground again. It at once churns whatever dust it may come in contact with while its speed is being brought back by friction to the normal wheel speed corresponding to the rate of forward movement. The importance of this defect of the differential extends to other questions than dust raising, notably to sideslip. This, however, is a totally different question, which in any case is likely to be brought before the public by the results of a 1,000 mile trial of an appliance which dispenses with the differential and which is now on test by the Automobile Club.

Yours faithfully,
MERVYN O'GORMAN.

April 9th.

GUARANTEES AND ENGINE RATING.

Again, this week, we have received a number of letters on this subject, but once more we are unable to see that any useful purpose is being served by a continuance of the discussion upon its present lines. The same arguments are advanced time after time in a more or less varied form, while little or no fresh points are being brought forward. We have therefore decided that this correspondence must cease with the present issue.

Amongst the communications received are letters from Mr. Weigel, Mr. B. Johnson, Mr. J. Lambert, and Mr. O. C. Ormsby, the gist of whose communications can be gathered from the following brief abstracts:—

MR. D. M. WEIGEL:—

I do not think I need waste the space in your valuable journal in going over old ground.

Two items are practically finished with:—1st. Mr. Edge has not denied that he charges in accordance with the three years' guarantee. 2nd. Mr. Edge has yet to accept my challenge to prove by independent tests that the car catalogued as 40-h.p. is really such.

Answering your correspondents, who have called upon me to answer. Surely "W. N." understood that no matter what power an engine may be capable of developing, it will only develop for the time being the power required to overcome the resistance applied.

In reply to Mr. Hodgkinson, the example he gives is that of a Crossley gas engine—quite a different proposition, and, therefore, does not call for a reply. With reference to the suggestion that the h.p. of a car is not important, I do not follow him. I presume Mr. Hodgkinson will agree that if an engine is catalogued as 40-h.p. it should be so, and not less.

I have never suggested that finality had been reached by the application of the unit of 10 cubic inches = 1 b h.p. As a matter of fact it will be found that 49 engines out of 50 will show on test to vary between 8·50 and 9·50 cubic inches per b.h.p. and my unit was, therefore, a good and fair one.

I see that Professor Hopkinson and Mr. Dugald Clerk bear me out in saying that there is no satisfactory formula for the rating of a petrol engine, but in my opinion I think it would be sound *commercially* to apply an easily calculable unit based on "good efficiency in present practice," and thereby prevent (as is being done to-day) the denominating of engines as the same, when some are twice as big as others. As an example, I have a list of 22 cars all styled 24-h.p. before me at the present moment, of which the largest is 460 cubic inch contents, and smallest 220 cubic inch contents.

MR. O. C. ORMSBY :—

Two of Mr. Weigel's recent statements appeared to me so manifestly incorrect that I compared them with the facts given in your valuable "Buyers' Guide," with the following results :—

Firstly, Mr. Weigel stated that the Winton car is the same average price per horse-power as the Maudslay, Dietrich, Daimler, Itala, Siddeley, and Fiat, whereas I find the truth is that the price per horse-power of the Winton is £14 and the average price of the others is £18 9*s*.

Secondly, Mr. Weigel says that the price of the other cars Mr. Johnson named, viz., Mercedes, Bollée, and Renault, is the same average per horse-power as above-mentioned cars. The following list proves his assertion to be incorrect :—

	per h.p.		per h.p.
45-h.p. Mercedes	£29	24-h.p. Itala ...	£18 10
40-h.p. Bollée ...	25	32-h.p. Siddeley...	18
35-h.p. Renault ...	23	24-h.p. Fiat ...	16
40-h.p. Dietrich ...	19 10	25-h.p. Winton ...	14
35-h.p. Daimler ...	19		

In spite of your correspondent's statement to the contrary, there must be some difference in "quality" between makes of cars, which enables some to be sold at better prices than others.

I am of opinion that only those manufacturers whose cars are of the very best "quality" will ever be able to give a three years' guarantee.

MR. B. JOHNSON :—

I note your correspondent, in your issue of the 7th inst., does not consider that motorists can possibly take the "quality" of a car into consideration, and objects to my having assumed such a thing. He also states that "all motors at the present moment are made of equally good material, and, therefore, such a point cannot be raised."

If we take this statement as correct, and material is not considered, it is very gratifying to know, then, that it is owing entirely to the magnificent British workmanship, design, and resulting efficiency for which the 6-cylinder Napiers are so noted, that they are worth more than any other cars—even than those with a larger cylinder capacity, which your correspondent appears to believe is the only point worthy of consideration.

MR. J. LAMBERT :—

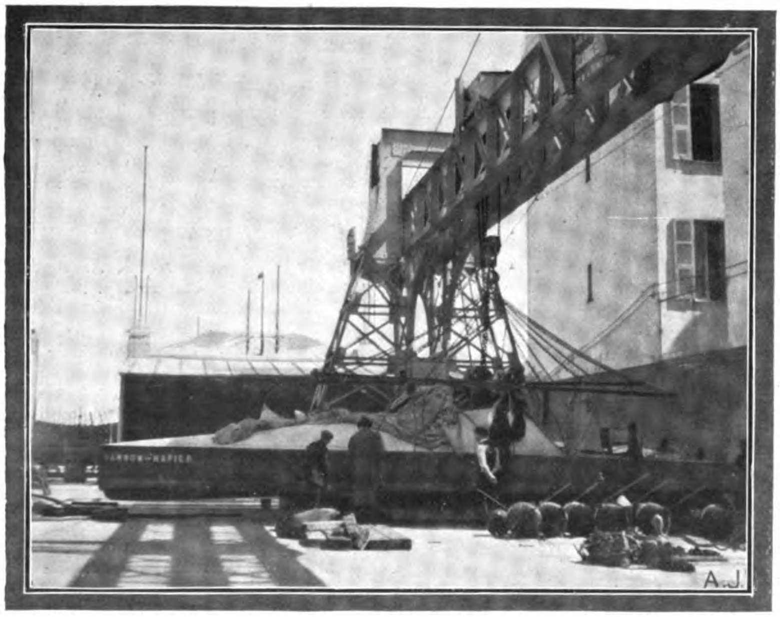
In reply to Mr. Weigel's letter in this week's AUTOMOTOR JOURNAL, my idea in writing my first letter, in your issue of March 17th, was to prove how utterly absurd it was to think of estimating the value of motor cars by their cubical contents. The imaginary engine there spoken of, with the twelve-inch stroke, would, of course, obviously be utterly useless for a motor car, but it would have enormous cubical capacity, and estimated on Mr. Weigel's plan would, on paper, appear perfect. In reply to this, in your issue of the 24th, Mr. Weigel said, to quote his actual words, "and above all, let me inform him (Lambert) that length of stroke has nothing to do with cubical inch contents."

In my letter in your issue of March 31st, I merely followed him out to a logical conclusion on his statements of the 24th ; in fact, so logical was this conclusion that Mr. Weigel has found it much more convenient to ignore this letter altogether. It was the wisest course for him to take. No answer was possible.

* * * *

The Motor Car not Accused this Time.

OWING to the eccentricities of a horse, which elected to be frightened by a few sheep on the road between Rishworth and Derby, a trap was backed into a wall one day last week, with the result that the wall gave way, and it and its occupants were precipitated 90 ft. over the cliff into Derby Delph. Out of the four occupants of the trap three were killed, but the surviving one was taken to the hospital by a passing motor car.



MONACO MOTOR BOAT MEETING.—In spite of the severe damage which both "Siola" and "Yarrow-Napier" sustained *en route* to the Riviera to take part in the Monaco Meeting, we are glad to be able to announce that, in addition to "Siola," a picture of which boat we gave last week, "Yarrow-Napier" was also sufficiently repaired to enable her to take the water again on Sunday last, and therefore to be at the line to take part in the race meeting. We give above a photo of this boat in the Exhibition, undergoing examination and repairs.

Boat Race Result by Motor Boat.

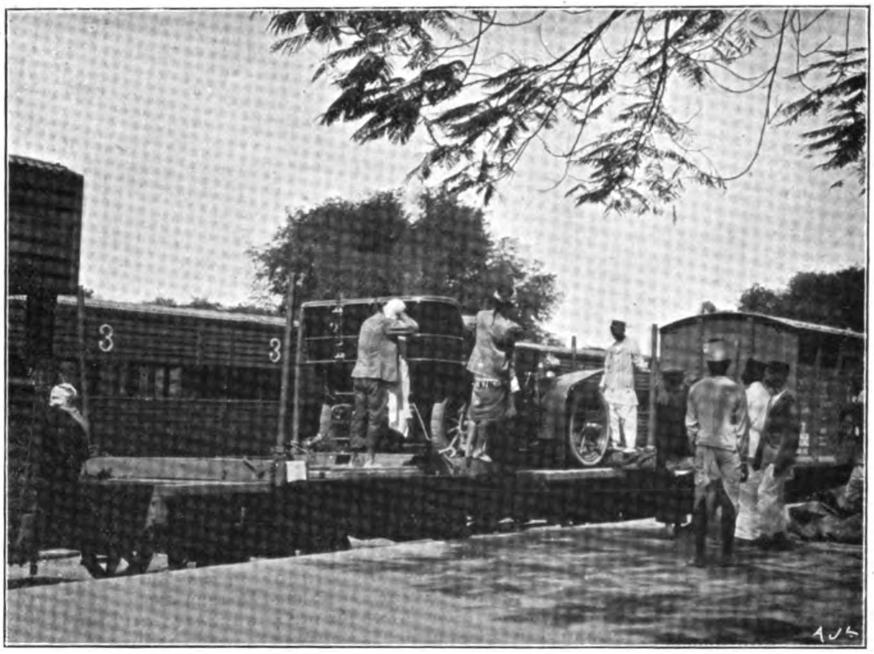
A SMART piece of work was done by the *Daily Mirror* on Saturday, when by means of a special motor launch they were able first to announce the result of the Oxford and Cambridge boat-race to the crowd by the river banks. The little craft was a 25-ft. Scott-Stirling cruiser.

Restricting the Rights of the Dog.

"THERE is something about a motor car which causes it, whenever it comes into fatal contact with a dog, to convert the veriest mongrel into a pedigree animal of the greatest value." This is what Mr. Staplee Firth, on behalf of Mr. Percy, sarcastically suggested in a case that recently came before the Croydon County Court, in which Mr. Percy was sued for damages by the owner of a dog which he had the misfortune to run over and kill with his car. The judge, who gave judgment in favour of the defendant, declared that "a motor car had as much right to be on the highway as a dog had, and there was an obligation on the owner of a dog to see that it was properly trained and under proper control, otherwise he could not hold anybody liable for any damage that might come to it," and he ultimately held that the plaintiff had failed to establish his claim, and that there must be a verdict for Mr. Percy with costs.

Mr. Glidden's Tour.

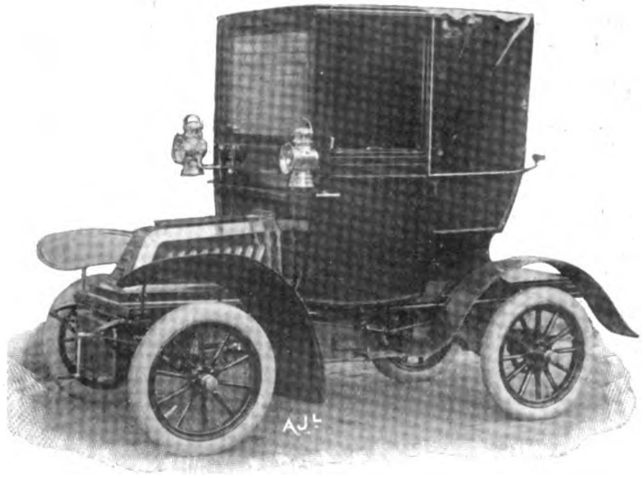
Mr. Glidden, whose tour round the world we have chronicled from time to time, and with whose very delightful experiences in India and Ceylon — more especially the latter country—we dealt at some length in a recent issue, has at long last found a country that has proved too much for his well-tried Napier. After covering 4,345 miles in India, Mr. Glidden toured through Burma, and eventually arrived at Mandalay. The roads between the Indian frontier and Mandalay were bad and rough enough, though, in spite of this, Mr. Glidden covered 500 miles on them. At Mandalay, however, he had to give in, for from that town to Rangoon there was nothing that could be even called a road at all, all the traffic and commerce between the two important centres being carried on the Irrawaddy. At Mandalay, therefore, the Napier had to submit to the unaccustomed experience of being hoisted on board a railway train. For a veteran vehicle that has now covered just on 30,000 miles in nearly every country in the globe this was something of an indignity, and no one could have been surprised had the car forcibly resisted. Our photograph shows the car in "durance vile" on the train at Mandalay. During the 43 days Mr. Glidden spent in India, Burma and Ceylon, he has covered upwards of 6,000 miles.



Mr. Glidden on his World Tour Trip found, between Rangoon and Mandalay, in Burma, that no roads were available for motoring, under any conditions whatever. He therefore had to ship his car by rail at Rangoon to reach the latter point. Our photograph was taken at Rangoon, showing the car being handled by the natives.

The Mobile Tram.

On the Acton Vale branch of the London United Tramways service a frisky tramcar, on Monday last, "jumped" the rails. The result was that in a very short time a continuous row of blocked tramcars extended from the point where the mishap occurred *for a distance of half a mile!*



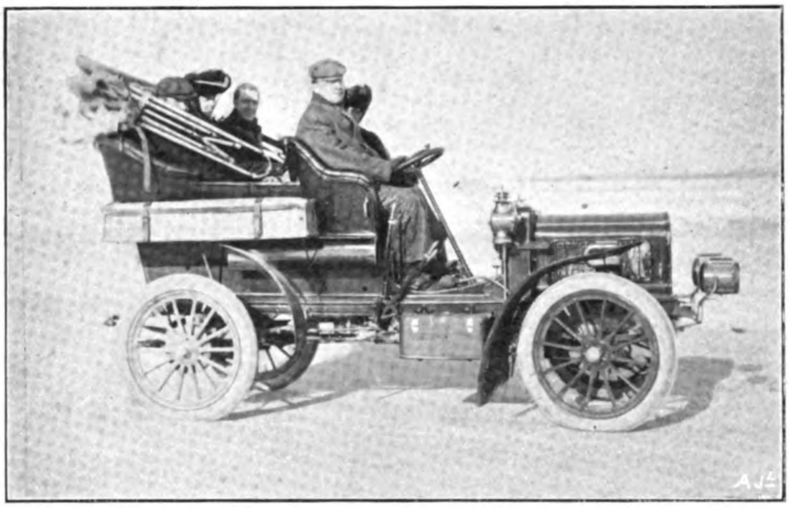
A neat form of carriage body, which should be found particularly convenient for doctors or commercial travellers, and those who are in the habit of driving in every conceivable sort of weather. Our photograph is that of an 8-h.p. De Dion car, 1906 model, the carriage body of which has been completed by Messrs. Mann, Egerton and Co., of Norwich.

8,000 Miles on a Crossley.

A long and exceedingly trying trans-Continental tour has just been carried out in a most successful manner by Mr. Ballin Hinde, with his 22–28-h.p. Crossley car. His itinerary carried him through France, Italy, Switzerland, and Austria, and even such out-of-the-way places as Croatia, Dalmatia, and Herzegovina. In some of these remote mountainous and semi-barbarous regions, the road surface was of a vileness calculated to upset the calculations of the most experienced motorist, unless perhaps he were accustomed to the dirt roads of America. But the Crossley car went through the ordeal admirably, and is, we understand, not the slightest degree the worse for the trying experience.

Traction Development in Lancashire.

An interesting development of traction facilities near Liverpool is expected shortly, when the new Lancashire United Tramways, Limited, get to work. The Hon. Arthur Stanley, M.P., chairman of the Automobile Club, is chairman of the new company, which proposes to link up a number of tramways together and run not only passenger but goods services from the pierhead at Liverpool to outlying points, such as St. Helens, Wigan, and Bolton. It is suggested that several trams coming in from junction lines may be linked up to form regular trains. The new company, too, proposes to have their own motor 'buses, both to relieve the pressure on the tramways and railways when there is extra traffic, such as a race meeting, and to feed the tramway termini and to take people from them further afield. The company also propose to carry mails.



The new Chairman of the Touring Committee of the American Automobile Association has been found in the person of Mr. Paul H. Deming, one of the pioneer, and most popular, motorists in America, and a graduate of Cornell University. Our photograph shows Mr. Deming on his White steam car, when he was present at the recent Ormonde-Daytona Beach racing. This is the identical car which Mr. Deming quite recently drove through Italy, Germany, France and England, before returning to America to attend the Ormonde Meeting.

Motor 'Bus Settlement.

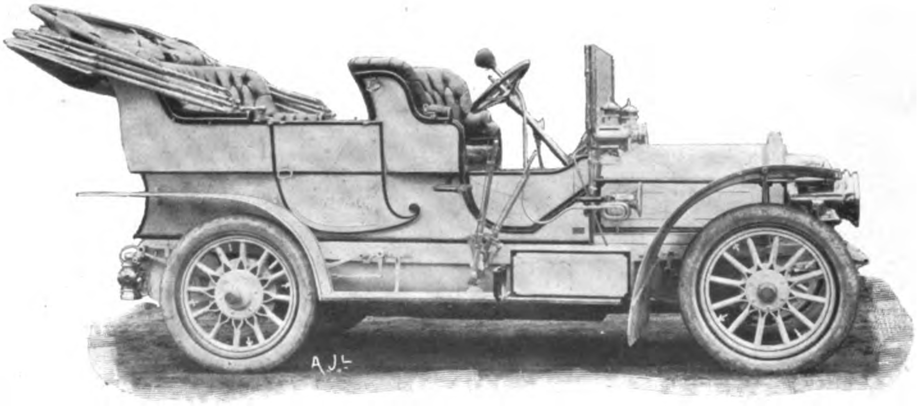
As chronicled recently, there was a short strike of the drivers and conductors of the London and Suburban Motor Omnibus Company. Things appear to have now been adjusted satisfactorily, and the employees in question have gone back to work at the old rate of wages, viz., 10*s.* per day for the drivers and 6*s.* per day for the conductors. It is, however, understood that a new system of payment is to be established at an early date.

Thornycroft Staff Dinner.

SATURDAY night was the occasion of a social gathering on the part of the various heads of departments of the famous Thornycroft firm. A dinner was held at the Criterion Restaurant, and this was succeeded by an excellent musical entertainment. Admiral Sir Cyprian Bridge presided, and Mr. J. E. Thornycroft occupied the vice-chair. To the general regret, Sir John Thornycroft was unable to be present, but Sir William Bull, M.P., and several other well-known motorists supported the chair.

Six-Cylinder Bayard-Clement Racers.

FOR racing cars, at any rate, it is evident that more and more of the Continental manufacturers are becoming convinced of the merits and the practicability of 6-cylinder engines. The Bayard-Clement firm are now building three live-axle cars with engines of this character, and have, it is reported, already attained a speed of 96 miles an hour on the level, with one that has been tested over the Sarthe Circuit.



One of the latest Models of the "Ariel-Simplex" Cars.—This has just been delivered to Mr. A. C. Peebles, of Edinburgh, and is a 25-30-h.p. 4-cylinder Car, the vehicle being strikingly handsome when travelling on the road.

Narrow Escape of a Judge.

THE HON. STEPHEN COLERIDGE was recently had up and "duly" fined for exceeding the speed limit between Newport and Cardiff, at which latter port he acts as Clerk of Assize. Mr. Coleridge not unnaturally expressed some regret that he had not been stopped the previous day, when he had the honour of driving the Lord Chief Justice of England in his car. Considering many things, one would certainly enjoy the situation that would have arisen had the Lord Chief Justice been either a co-defendant or a witness for the defence. It is at any rate satisfactory to learn that he has been introduced to the pleasures of motoring.

Record of Motor "Accidents."

THE following figures of the deaths caused by motor and other mechanically-driven vehicles in 1903 and 1904 for England and Wales are supplied to the Home Secretary by the Registrar-General in response to a question put recently in the House of Commons by Mr. Timothy Davies :—

Nature of vehicle.	Total 1903.	Total 1904.
Motor car or carriage	*39	†59
Motor cycle	13	16
Motor omnibus	—	2
Electric tram	‡64	55
Steam tram	1	2
Traction engine	§19	29
Motor dray, wagon, &c.	1	9
Steam roller	4	5
	141	177

* Including two cases where the coroner's jury returned verdicts of suicide.

† Including two cases where the coroner's jury returned verdicts of manslaughter.

‡ Including one case where the coroner's jury returned verdict of manslaughter.

§ Including one case where the coroner's jury returned verdict of suicide.

Of the 141 deaths in 1903, 112 were of males and 29 females, and of the 177 deaths in 1904, 131 were males and 46 females. The Home Secretary is unable to give the figures for Scotland and Ireland.

The "Austin" Petrol Cars.

On Saturday last, a most successful trial trip was conducted with the first "Austin" chassis that has been turned out in the new factory, when we learn that this vehicle created an excellent impression amongst all those who were present.

Cab and Omnibus Reform.

Mr. Henry Norman, M.P., has been elected Chairman of the Committee considering the questions relating to London cabs and omnibuses.

* * * *

COMMERCIAL POINTS.

Accumulator Re-charging and Repair.

At their Coventry depôt, extensive additions have recently been made by United Motor Industries to their accumulator repair department, and a new lead burning plant has just been laid down. They are, therefore, able to cope with the ever-increasing demand which they have experienced for work of this kind. We learn, too, that the recharging facilities at the depôt have been trebled during the past few months.

The Austin Motor Company's Repair Department.

We have received a copy of a neat little booklet which is being issued by the Austin Motor Company to motorists in the Birmingham district. In it full particulars are given of the very well-organised and specially equipped repair department at the new Longbridge Works, where a section has been set aside under the charge of Mr. A. J. W. Millership for this express purpose. Any make of car can be attended to in this department, and a very thorough system has been adopted for ensuring good results.

A privately organised show of motor cars is proposed to be held by the Motor and Electrical Engineering Company, Limited, of Leeds, for about ten to fourteen days at the end of April. The company consider that their premises, which are situated in the centre of the city, and were formerly in the occupation of the Leeds Tramways Company, constitute an ideal place for such a show, the premises normally being employed as a huge garage. An inclined motor way is to be fixed in the ground floor hall, this giving access to the first floor, and enabling cars to be tested for their climbing powers under such conditions.

BRITISH EXPORTS AND IMPORTS OF MOTOR CARS, &c., FOR 1906.

Note.—In our issue for January 13th, 1906, we published in one table the full figures of British Exports and Imports for 1902, 1903, 1904, and 1905. Prior to 1902, motor cars were not classified separately.

1906.	Imports.					
	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.
		£	£		£	£
January ...	458	175,270	136,720	114	2,889	1,989
February...	530	211,824	184,598	130	3,507	1,511
March ...	600	230,887	184,763	258	7,440	3,556
Total...	1,588	617,981	506,081	502	13,836	7,056

A Chance for a Good Agency.

The British agency for a first-class Italian car is just now procurable by any really good firm who has an opening to push a high grade vehicle. The standard sizes are 18-h.p. chain or live-axle drive, 24-h.p. chain drive, and 40-h.p. chain drive. Exceptional terms, we understand, can be arranged for really good representatives. We shall be pleased to place any firms in direct communication upon receiving a letter addressed to "Italian Agency," care of The Automotor Journal.

Mr. Charles A. Smith, the proprietor of the White Lion Hotel, Cobham, Surrey, asks us to mention to all motorists, that his roomy garage at the back of his hotel, together with the hotel attendants, are entirely at the disposal of visitors using the hotel, free of cost. He desires us to mention this fact, as it appears that a motorist last Sunday evening complained of the loss of a rug from his car, which he had left unattended in the street, outside the hotel. The motorist did not leave his name and address, so that the police were afterwards unable to communicate with him.

Messrs. H. E. Steel, Limited, have, under the title of the "County of Gloucester Garage," just opened new premises at High Street, Cheltenham. This is a very important addition to the automobile engineers in the West of England, who are competent repairers, and able to thoroughly deal with motor cars in that neighbourhood.

All Dunlop Tyre Depôts remain open throughout the Easter holidays.

The Central Insurance Company have prepared a printed card for hanging up in garages, hotels, &c., &c., calling attention to the various measures of precaution which it is desirable for all who have the care of motor cars to observe with the object of preventing accidents of all descriptions. The card is attractive, and should be useful.

For the Tourist Motor Race "Coppa d'Oro," May 15th to 25th, organised by the Italian Automobile Club, the Continental Tyre Company are offering prizes to the value of £480 to cars on Continental Tyres which arrive first, second, third, and fourth in the different classes.

Mr. H. Waymouth Prance, A.I.E.E., informs us that he has commenced practising as an automobile engineer at 39, Westbourne Gardens, Bayswater, W.

The British Automobile Commercial Syndicate, Limited, advise us that they are now prepared to take orders for their B.A.C.S. 'bus chassis, 30 h p. and 35 h.p. They at present have a sample on view at their Long Acre premises, and are prepared to deliver practically at once.

The Continental Tyre and Rubber Company (Great Britain), Limited, 102–108, Clerkenwell Road, E.C., wish to draw attention to their Manchester branch, and ask that all tyre repairs in the district should be sent there.

* * * *

PUBLICATIONS RECEIVED.

Official Guide to Great Yarmouth. Edited by W. J. Sayers. Printed and published for the Corporation by Jarrold and Sons, Limited, London Street, Norwich. Gratuitous.

Catalogues.

Climax Motors, 1906. Climax Motors, Limited, Coventry.

Simms Commercial Motor Vehicles. The Simms Manufacturing Company, Limited, Kimberley Road, Willesden Lane, N.W.

1906.	Exports, British and Irish make.								Foreign and Colonial Re-exportation.					
	No. of Cars and Value.		Parts Value.	*B.S. Africa.	No. of Motor Cycles and Value.		Parts Value.	*B.S. Africa.	No. of Cars and Value.		Parts Value.	No. of Cycles and Value.		Parts Value.
		£	£	£		£	£	£		£	£		£	£
January ...	146	48,759	16,334	6,825	84	2,112	2,211	637	68	26,999	9,582	4	205	355
February ...	72	19,493	19,838	5,642	44	1,298	1,980	288	39	19,688	5 840	2	65	201
March ...	89	31 814	22,940	4,712	66	2,469	2,372	801	56	28,373	8.203	8	277	420
Total	307	100,056	59,112	17,179	194	5,879	6,563	1,726	163	75,060	23,625	14	547	976

* *Included* in the totals of Cars, Cycles, and Parts.

NEW COMPANIES REGISTERED.

Ariel Motors (1906) (Limited).—Capital, £125,000 in £1 shares. Objects, to take over the business of the Ariel Motor Company, Limited, of Long Acre, W.C., to acquire the freehold motor works at Selly Oak, Birmingham. First directors, J. F. Albright, A. C. Peebles, G. B. Elkington, J. P., J. E. Hutton, and C. T. B. Sangster.

Autoloc Syndicate (Limited), 19-20, Holborn Viaduct, E.C.—Capital, £60,000 in £5 shares. Object, to acquire the British patent for an invention known as the "Autoloc." First directors, L. Stroud (chairman) and W. D. Ross.

London Standard Motor Omnibus Company (Limited).—Capital, £250,000 in £1 shares. Directors, F. W. Kerr, F. J. E. Horstmann, G. Offor, S. A. Silleur, and J. Goode. Public issue, 200,000 ordinary shares, April 4th.

Straker and MacConnell (1906) (Limited), 20, Avonmore Road, Kensington, W. Capital, £250,000 in 249.900 ordinary shares of £1 each and 2,000 deferred shares of 1*s*. each. Object, to manufacture and deal in motor carriages, omnibuses, &c. First directors, J. MacConnell, W. H. Warlow, H. P. MacConnell, A. Willis, and Sir J. Heron-Maxwell, Bart. Public issue of 150,000 ordinary shares, April 4th.

Belfast Marine Motor Company (Limited), 38, Waring Street, Belfast.—Capital, £1,000 in £1 shares. Object, to purchase the goodwill and business of W. S. Hayward, trading as the Marine Motor Company.

Edwards and Sons (Torquay) (Limited).—Capital, £10,000 in £1 shares (3,500 preference). Object, to acquire the business of carriage, motor car, &c., builders carried on at 112 and 114, Union Street, Torquay, as Edwards and Sons. First directors, Dr. J. W. Noble (chairman), G. Edwards (managing director), W. E. Parker, W. R. Harding, and W. M. Port.

* * *

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

5920. 21st March, 1905. Improvements in and relating to Apparatus for Preventing Lateral Slipping of the Wheels of Mechanically-Propelled and other Vehicles. George Macbeth, 85, Brixton Road, London. This invention relates to apparatus for preventing lateral slipping of the wheels of mechanically-propelled and other vehicles. There are five figures. Fig. 1 is a back view of a motor vehicle fitted with the improvements, showing the disc and parts in the normal running position when in use. Fig. 2 shows the running wheel or disc of the device tilted in one direction. *a* are the arms, which are sufficiently strong to ensure rigidity, being connected together at the top by a cross bar, a^1, or formed in one with it. In the case shown, the arms are attached to the axle, *x*, of the vehicle, being pivoted thereon to enable them to be raised or lowered. The arms, *a*, are forked at their lower ends, and an inclined slot, *b*, extends up from the lower edge of the arms to a suitable distance upwards. Between the arms, *a*, the central rotatable wheel or disc, *c*, is provided, and the normal position of this wheel is parallel with the road wheels, *y*, of the vehicle. The central wheel or disc, *c*, may have an indiarubber tyre, so arranged as not to cut into, damage, or deface the road surface whilst running in its normal or upright position. On the inside of each arm, *a*, and at right angles thereto and opposite each other, is mounted a stud or projection, *d*, so designed as not only to assist the central wheel in maintaining its normal or upright position, but also in the event of the vehicle slipping to the slightest extent in a lateral direction on either side one or other stud or projection, *d*, according to the direction of the lateral slip, will at once impinge upon the side of the outer portion of the central wheel or disc, *c*, and cause the same to immediately tip or tilt, and thus form a wedge between the fork stud or projection, *d*, and the road surface, thus preventing any further lateral slip of the vehicle. The elongated spindle, *e*, carrying the wheel or disc, extends on either side through the slots and beyond the arms, *a*, the spindle being free to rise or fall in the slots, *b*, according to the inequalities of the road surfaces, and also to allow the central wheel or disc, *c*, to tilt to either side. At each end of the lengthened spindle, *e*, is mounted a disc device, *f*, which in the case shown has serrated edges. These discs, *f*, are designed to grip the road surface only in the event of the spindle, *e*, being titled by the central wheel or disc, *c*, owing to lateral pressure on the latter passing through one of the studs or projections, *d*, on the arm by the lateral slipping of the vehicle.—March 21st, 1906.

FIG. 2.

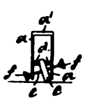
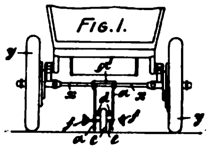
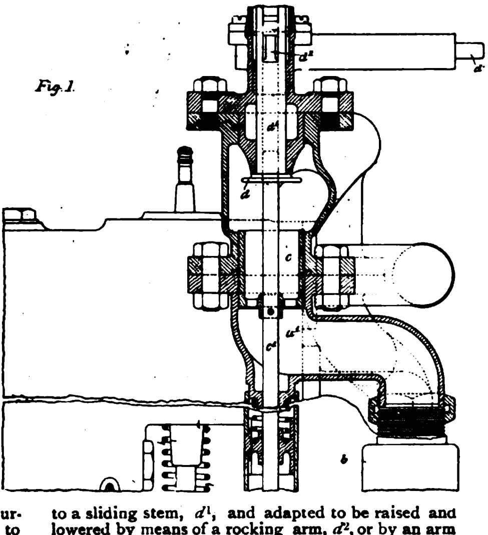


FIG. 1.



11550. 2nd June, 1905. Improvements in or relating to the Governor Mechanism of Internal Combustion Engines. White and Poppe, Ltd., and Peter A. Poppe, both of Lockhurst Lane, Coventry. This invention relates to means for governing and throttling internal combustion engines such as are used in connection with automobiles, and has for its object to provide such engines with an adjustable governing system, which may, at the option of the driver, be set so that the vapour will be throttled or cut off on the engine exceeding any particular or predetermined speed. Existing types of automatic governors merely provide for the throttling of the vapour on the engine exceeding one particular speed, and no alteration can be made in this respect other than by altering the tension of the governor springs. This invention, however, provides governing mechanism which is readily adjustable, and which will throttle on any particular speed being attained, so that it will cut off the vapour from the engine at say 400 revolutions, or at 600 revolutions, or at any other number of revolutions within the limit of the maximum speed of the engine. There are three figures. Fig. 1 represents in section parts of a vertical-cylindered internal combustion engine provided with compound governor mechanism. The induction pipe or vapour inlet pipe, a^1, leading from the carburettor, *b*, has arranged within it a sliding sleeve or tubular piston, *c*, having a passage or passages therethrough of sufficient area to enable the vapour to pass freely, and without throttling, to the inlet-valve chamber of the engine, and which is connected by a rod, such as c^1, with the usual automatic governor mechanism, whereby the piston is raised or lowered, or its position within the induction pipe is changed, according to the fluctuations of the engine speed. The adjustable element of the mechanism is located above the governor-controlled piston in the form of a disc or plate, *d*, connected to a sliding stem, d^1, and adapted to be raised and lowered by means of a rocking arm, d^2, or by an arm or spindle, such as d^3, and operated primarily by a hand or foot lever on the dash-board or foot-board of a car. Suitable means are also provided for holding this adjustable disc or member in any desired position within the inlet pipe, it being understood that the point at which the vapour will be throttled or cut off is dependent upon this position, and that when, as a consequence of the increase of the engine speed, the governor-controlled piston is raised or moved to such an extent that it will come approximate to this disc, the free passage of vapour through the piston will be checked or prevented, and the vapour will be throttled or cut off accordingly. The adjustable part of the throttle mechanism is so arranged that, when placed in its highest position, the engine will receive sufficient vapour to enable it to run at its maximum speed, even when the governor-controlled element is also lifted to its maximum position. With the adjustable element set in any other position between the highest and lowest points, the supply of vapour to the cylinder or cylinders will either be diminished or entirely cut off as soon as the element, *c*, is lifted by the governor to its highest position.—March 21st, 1906.

Fig. 1.



Patent Specifications Published.

Applied for in 1004.

Published April 5th, 1906.

26,986.	H. V. JAMES AND R. A. MARPLES. Electrically-controlled variable speed-gear.

Applied for in 1005

Published April 5th, 1906.

2,694.	H. I. MAILLARD. Ignition devices.
2,695.	H. I. MAILLARD. Sparking plugs.
4,747.	H. M. MARBLE. Silencers.
4,790.	T. W. MOORE. Tread services for tyres.
4,815.	S. C. GRAHAM. Clutches.
5,735.	J. BYROM. Radiators.
5,740.	M. PEDERSEN. Gearing.
6,089.	T. W. S. HUTCHINS. Magneto electric generators.
6,541.	H. A. WILLIAMS. Friction clutches.
7,720.	H. LEITNER. Electric accumulators.
10,003.	METROPOLITAN AMALGAMATED RAILWAY CARRIAGE AND WAGON CO., LTD., AND J. S. CURRALL. Sliding lights of motor omnibuses.
10,680.	B. S. ROBERTS. Transmission gear.
11,550.	WHITE AND POPPE, LTD., AND P. A. POPPE. Governor mechanism.
11,748.	A. H. P. BLUNT. Flying machines.
12,486.	M. C. HUNTER. Silencing and cylinder scavenging device.
13,224.	A. T. COLLIER AND REILLOC TYRE CO., LTD. Tyres.
15,852.	P. A. N. WINAND. Intl. combn. motors for submarine vessels and torpedoes.
20,146.	BARON P. DE CATERS. Clutch and variable speed-gear.
20 511.	J. E. PARRISH AND R. H. SMITH. Speed indicating and alarm devices.
22,547.	W. AND W. A. F. BURROWS Spring wheel.
22,707.	SOC. CHARRON, GIRARDOT, AND VOIGT. Flexible and elastic shaft coupling.

Published April 12th, 1906

5 829.	G. W. BRINDLEY and others. Electrical ignition device.
7,507.	C. H. FOSTER. Horns.
7,948.	W. J. CROSSLEY AND A. V. COSTER. Valve gear.
9,414.	J. S. FAIRFAX. Motor vehicles.
9.415.	J. S. FAIRFAX. Road and rail motor vehicles.
10,663.	G. HOARE. Traction engines and motor road vehicles.
10,972.	W. WILCE. Steering gear.
11,338.	SIR W. G. ARMSTRONG, WHITWORTH, AND CO., LTD., AND W. G. WILSON. Motor cars.
11,694.	P. WACHTEL. Intl. combn. motors.
12,900.	L. K. CLARK. Driving mechanism.
14,685.	J. GRUMMETT. Bodies of motor cars.
15,256.	P. W. NOBLE. Carburettors.
15,698.	E. R. MUMFORD. Aerodromes or flying machines.
15,858.	D. THOMAS. Anchor for airships.
21,297.	W. H. ELEY AND A. R. BARNES. Variable-speed gearing.
21,643.	J. KRITZLER. Sparking plugs.
24,413.	E. V. GRATZE. Speed and distance indicator.
25,167.	KRIEGER AND CIE. Motor-driven vehicles.
25,173.	KRIEGER AND CIE. Electric vehicles.
26,486.	E. SANCHIS. Frames.
27,160.	A. HERISSON. Friction clutches.

Applied for in 1906.

Published April 5th, 1906.

3,762.	M. SIZAIRE, G. SIZAIRE, AND L. NAUDIN. Steering gear.

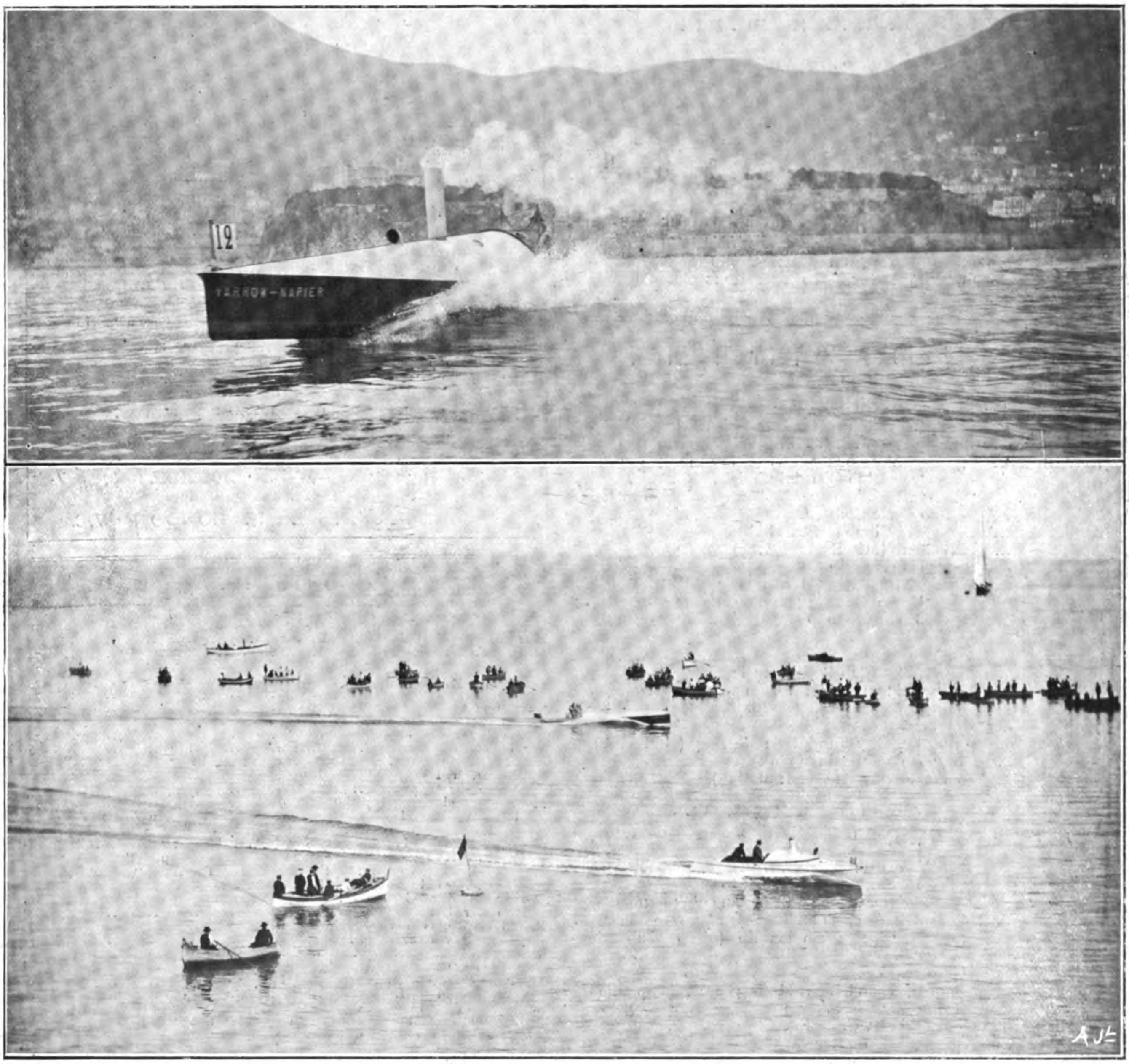
Published April 12th, 1906.

5,019.	B. SMITH. Anti-skidding device.
5,453.	J. M. FERRAZ. Elastic wheel.

The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

No 276. (No. 16, Vol. XI.) APRIL 21ST, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.



MONACO MOTOR BOAT MEETING.—"Yarrow-Napier," the British-built motor boat, which has made such a fine record at the Monaco Meeting, is shown in our top photograph at full speed. In spite of the serious injury which she sustained *en route* to Monaco, she completed, steered by Lord Montagu, her owner, the fifty kilometre course on the second day of the meeting. In spite of the very heavy sea which was running, she thus won the race against the leading Continental racing boats entered in the 8-12 metre class. Subsequently, in the big handicap, she was steered by Mr. Seaton Edge to a grand victory against the whole of the rest of the competing craft, beating the crack boat of the meeting, the Italian motor boat "Seasick," by five seconds. These victories are the more remarkable as owing to the temporary patching up which had to be effected at Monaco to enable her to race at all, very grave risk was taken when full speed was put on. In fact, it was only occasionally that it was possible for the engines to be fully worked under these conditions. The lower picture shows the finish of one of the races in calmer water, the further boat being "Yarrow-Napier," and the one in shore "Calypso."

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DIARY OF FORTHCOMING EVENTS.

British Events.

April 21 ..	Maple Hill Climb (Hertfordshire A.C.).
April 21 ...	Birmingham M.C.C. Hill Climb.
April 21 ...	Hertfordshire County A.C. Hill Climb.
April 25 ...	Auto-Cycle Club Quarterly Trials.
April 26 ...	"Lubrication." Paper by Mr. J. W. G. Brooker (Auto-Cycle Club).
April 28 ...	Open Hill Climb (Essex M.C.).
April 28 ...	Hill Climb (Mid Stafford A.C.).
May 12 ...	South Harting Hill Climb.
May 24 ...	Frome's Hill Climb (Herefordshire A.C.).
May 26 ...	Motor Union Meeting (Birmingham).
June 11-16 ...	Land's End to John O'Groat's (Auto Cycle Club).
June 13-15 ...	Scottish Reliability Trial.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July ...	Motor Yacht Club Reliability Trials.
July 14 ..	"Henry Edmunds" Hill Climb.
July 21 ..	Motor Union Meeting (Bath).
Aug. ...	*Van Trials.
Aug. 6-18 ...	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Sept. 22 ...	Motor Union Meeting (York).
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

April 18-26 ...	French Resilient Wheel Trials.
April-May ...	Milan Exhibition.
May 1-15 ...	Paris Voiturettes Trial (*L'Auto*).
May 6 ..	"Targa" Florio (Sicily).
May 12-21 ...	Tour de France (Motor Cycles and Voiturettes).
May 14-31 .	Milan Reliability Trial.
May 27 ...	Motor Bicycle Championship (Moto Club de France).
June 6-13 .	Herkomer Cup.
June 17 ..	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26-27 ..	Grand Prix (A.C. de F.).
June 28-29 ...	Kiel Motor Boat Races.
July 8 .	Motor Bicycle International Cup Race (Austria).
July 14-17	Ostende Meeting.
July 15 ...	Mont Cenis Climb (Turin A.C.).
July 25-Aug 15	Circuit Européen.
Aug. 13 ..	Ardennes Circuit.
Aug. 18 ..	Coupe de Liedekerke (Belgium A.C.).
Aug. 20-Sept. 2	Brescia Week (Italian A.C.).

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

Sir A. Conan Doyle makes a Proposal.

Owing largely no doubt to Lord Roberts' crusade in favour of the formation of rifle clubs for home defence, the schemes of securing the country against invasion, not merely by naval supremacy, but by military preparation, on the home side of the "silver streak," are attracting quite a flood of attention. Amongst the latest of these schemes is one which will have special interest for automobilists, and its interest will be all the greater as it is the idea of Sir A. Conan Doyle, who has been for a considerable time an enthusiastic motorist, and equally enthusiastic in the interest he has taken in the military affairs of the Empire. *If*, and it is, of course, a very large and imposing "if," a foreign invader ever succeeded in getting a foothold upon our shores, the whole question of his subsequent success or failure would in all probability depend in the promptness with which measures were taken for his discomfiture before he could get out an adequate supply of scouts and elaborate an effective cavalry screen behind which to develop his real system of attack. This, thinks Sir A. Conan Doyle, is evidently the point at which automobilists should be able to come effectively to the assistance of their country. He proposes that a thousand motorists, by which, of course, he means car-owners, a number which he thinks could be easily trebled, or quadrupled, should organise themselves and pledge themselves to operate on the first news of an invasion. The thousand or so automobilists are, in time of peace, to be in touch each with three or four or as many picked riflemen as he can carry on his car, for whom a supply of ammunition, say 2,000 rounds or more, should be provided by the Government, together with a week's supply. Each motorist, with his riflemen, would then at once betake himself to the spot where the invasion was proceeding, and, owing to the mobility which the motor cars would confer upon them, should be enabled to form a fringe round the invaders which should at any rate effectively hamper, and prevent them developing, their movements till the regular military forces of the Crown could appear on the scene. It is not our province to criticise the suggestion from a military point of view, or to inquire whether any power is likely to invade these islands before they had secured supremacy at sea. If they did so, four or five thousand smart riflemen with practical experience ought to be able to hold them in check for a short time at least. Should the movement take practical shape, however, we need hardly remind Sir A. Conan Doyle that his motorists and riflemen should be enrolled as part of the forces of the Crown, and should, besides their motor cars, rifles, and provisions, have uniforms of some kind ready to get into when the emergency arose, for private enterprise in this way is not encouraged by the rules of war, and any ununiformed assailants taken prisoners are usually given "a short shrift and a long rope." The scheme, at any rate, has this to be said in its favour, that any attempted invasion, till a naval supremacy was secured, could hardly, in spite of the "Invasion of 1910," involve numbers that Sir A. Conan Doyle's corps would be unable to deal with. In any case the proposal is an interesting testimonial to the recognised growing military importance of the motor car, and the gifted author is not a man who speaks without having thoroughly considered his subject, and is altogether the exact antithesis of the unpractical dreamer.

The Canals Commission.

There is something about the very idea of a canal that is suggestive of leisurely movement, if not actually of dignified repose. Even the most enthusiastic reformer could, at any rate, hardly maintain that the future of our waterway is a *burning* question. One cannot, therefore, feel greatly surprised that, at the last sitting, the Canals Royal Commission announced their decision to adjourn for five weeks, and after that to hold but bi-weekly *séances*. However, the subject is at last receiving adequate consideration, and if it does not move rapidly (as, indeed, could scarcely be expected)—"*eppur il muove.*" Of the evidence given at the last sitting, the general tendency of that given by the principal witness, Mr. Lee, was in favour of central control with local contribution to the cost of up-keep, the State and the local bodies joining to defray the cost of any scheme adopted. This is in outline the same sort of arrangement as we have always advocated in a system of road administration, and if the Commission ultimately adopts, as it is to hoped it may do, Mr. Lee's views, the result may have a beneficial effect in obtaining recognition for this important principle, not only for canals but also for highway management as well.

◆ ◆ ◆

Restricting Tramway Aggression.

Public thanks should be tendered to the Roads Improvement Association for the able manner in which that body has, for a considerable time past, been engaged on the public behalf in combating the efforts of tram companies to absorb as much as they can of the King's high road without consideration for the convenience of other users. On one point the Association have now a distinct victory to record. The Board of Trade, which is the authority to which the tramways have to bow, has promulgated a memorandum regulating the details of construction which will have to be observed in all future tramway enterprise. The memorandum, amongst other things, ordains that there shall be 15 in. clearance between the sides of tramcars and the kerb, and the same distance between passing cars; while no centre-posts are to be used without the consent of the Board being obtained in every instance. This latter point was one on which strong representations were made by the Roads Improvement Association to the Board of Trade, and the acceptance of the principle by that Government department is a good object lesson in what can be effected for the public good by a representative and energetically-conducted association.

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The Eternal Dust Problem.

The present long-continued spell of dry weather is beginning to produce its usual effects. In every direction the piercing cry of the dust those terrible motor cars produce is growing loud and shrill, though as the temperature has not been excessive and the dog days are still remote, the "Juggernaut" has not as yet been decked out in his summer trappings and dragged forth from his garage, wherever that may be. To speak seriously, the question of dust is becoming every year a more truly awful problem, and this year it has become an awful problem earlier than usual. The future of road locomotion depends upon its satisfactory solution, for the community will not permanently tolerate the neighbourhoods of all main roads being reduced, every time there is a spell of dry weather, to a condition resembling that of Naples after the recent performances of Mount

Vesuvius, or that it should be necessary for Mr. G. R. Sims to seek the centre of a desolate heath near Uxbridge in order to find air clear enough to see the time by his watch. Under the circumstances it is impossible to be satisfied with the attitude usually adopted by the local bodies who are responsible for the maintenance of our high roads. They know perfectly well that the amount of motor traffic is steadily increasing, that dry weather during spring, summer, or autumn may be anticipated with practical certainty, but with some noteworthy and progressive exceptions, they still cling to the same old methods of making up their highways with stones below and dust or dirt on top. When the inevitable result occurs with the regularity of clockwork, when roadside villagers are half choked with dust, property depreciated and everybody very angry, then the local bodies hold up their hands in pious horror and denounce the automobile.

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A Possible Method of Solution. Now this merely denunciatory and *non possumus* attitude does no one, not even local ratepayers, a particle of good. It brings us not a particle nearer a satisfactory solution. It is merely a record of the not unnatural despair of the local bodies in regard to what should be done. The first necessary step—there can hardly be a doubt about it—is for some general agreement and cooperation between all the district councils in the kingdom and the Local Government Board to be arrived at. What is really needed in each district is a considerable amount of capital expenditure. The roads must be made up, when they *are* "made up," on a different principle to that hitherto adopted. The old system of stones below and dirt or dust above is out of date, but district councils are largely obliged to adhere to it, partly, perhaps, from want of a general consensus of opinion amongst surveyors as to the best dustless method of making up roads, and partly because any such methods involve an initial expenditure which, as it will pay for itself by diminished upkeep, cannot in any fairness be thrown on one year's rates, but ought to be spread over a succession of years, in the same way that drainage and other similar schemes are dealt with. The selection of the precise method of road construction is perhaps less important. Experiments have demonstrated that there are, at any rate, two or three methods of making up roads with dustless materials that are satisfactory and reliable. But to adopt them the proper course would be for each district council to obtain the Local Government Board's sanction to a loan, to be paid off in the usual way, to cover the initial increased expenditure. Doubtless the establishment of a central organisation controlling the road management of the whole country, as advocated by the Roads Improvement Association, would be the best method to adopt, but failing that, co-operation between the district councils and the Local Government Board might go a long way towards solving the problem. We have before now called attention to the remnants of the ancient pumps along the Bath Road—where the dust trouble is now particularly acute—that were used for watering the roads in the old coaching days. The expense of this must have been most formidable. Capitalised, it in all probability represented far more than the cost of making up the road by one of the modern scientific methods, which would, in the main, get rid of the dust nuisance for good. If such expense could be incurred a hundred years ago, when the wealth of the country was but a tithe of what it is now, it is nothing short of a reproach to the common sense and administrative capacity of the country to allow the present state of things permanently to continue. The Local Government Board, however, can alone help the district councils out of their difficulty, by sanctioning small loans on the lines we suggest, and there would seem no reason why the Board should not draw up a circular letter and send it to the local bodies, explaining their willingness to act in the way suggested. The question is simply one of supreme national importance.

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Far-Sighted Generosity. As will be seen from our correspondence columns, the Daimler Company have just offered a contribution of 100 guineas towards the Defence Fund of the Motor Union. We sincerely trust that this wise and generous action on the part of the Daimler Company's directors, through their chairman, Mr. E. Manville, will have a good effect in stimulating other manufacturers and automobile companies who already contribute to the Union's funds to increase their subscriptions, and will also bring home to those who have not hitherto done so the importance—we might almost say the necessity—of supporting the Union, and particularly the Defence Fund, on as liberal a scale as possible. The public generally, and even probably the automobilist who has been assisted by the Union, when the victim of unjustifiable litigation or police persecution, hardly realise the amount of money which the Union disburses in this way. In little more than a week, recently, the funds of the Union have been disbursed in no less than eight different cases of this kind, grants being made up to as much as £30. The regular drain on its funds, in fact, is immense. It is scarcely an exaggeration to say that the future of the automobile movement, at any rate its future prosperity, is largely bound up with the existence of a society which is in a position to stand behind automobilists in the way the Motor Union at present does. It is not merely the actual amounts contributed—though these in all cases will be larger if the funds of which the Union has control are more extensive—but the effect which is produced in the public mind by the knowledge that individual motorists do not stand alone, that the whole of unjust costs to which they may be put will not be borne by them, and that in serious cases of oppression or aggression they will be ably and powerfully supported, both financially and by the best expert and legal assistance. There are many people who have considered whether they will take up automobilism as a pastime or not, who have hesitated to do so owing to the police persecution which they but too reasonably anticipated, and the probability of any claims for damages that might be made against them being decided to their disadvantage, who would never have become owners of cars at all but for recognising that by joining the Union they would obtain support of the kind to which we refer and be financially backed up whenever they deserve it. The influence that the Union can produce in this way is almost directly, of course, dependent upon the funds it has in hand. Manufacturers, therefore, will be merely consulting their own truest interests by following the example of the Daimler Company, and seeing to it that the Motor Union is always provided with sufficient cash in hand to enable it to respond to appeals as fully as its capable and far-sighted management considers advisable.

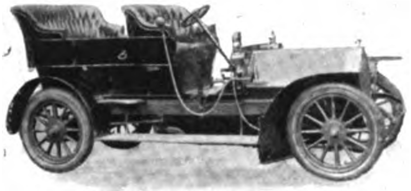
How to Recognise the Cars of To-day.

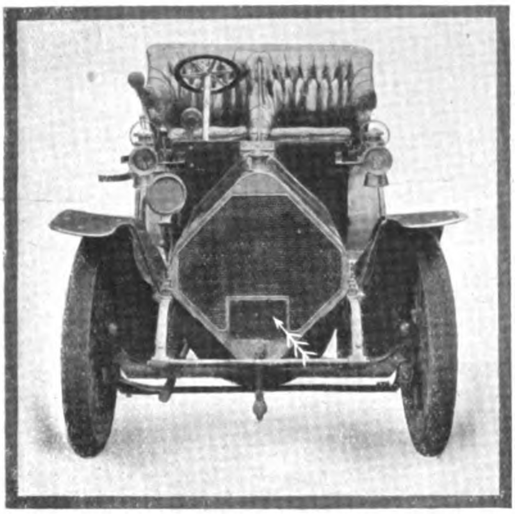
(No. 21).

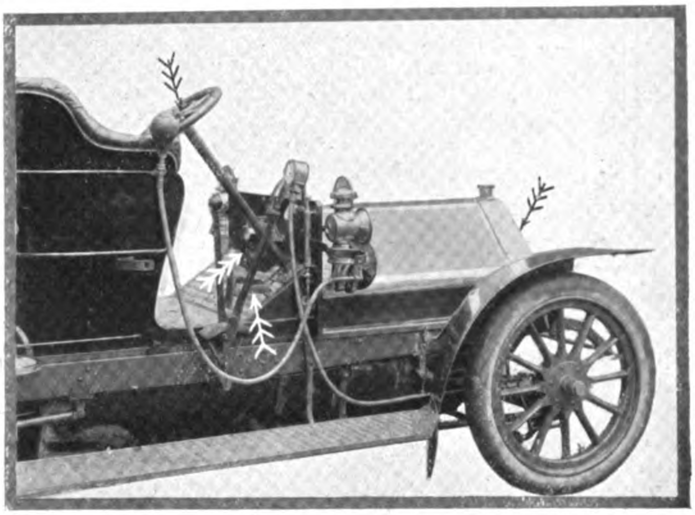
The Iris

(BRITISH)

25-30 H.P. & 35-40 H.P.







The Legros and Knowles "Iris" Cars are unique in their appearance on account of the DIAMOND-SHAPED RADIATOR. Formed in the radiator itself is a PUMP CHAMBER, which is very noticeable as it gives a peculiar outline to the tubes. Above the steering wheel there is ONLY ONE CONTROL LEVER. A very neat LUBRICATOR, which combines several other fittings, forms one of the few dashboard fittings. The pedals are bent in a peculiar manner, so that the pedals are nearly upright

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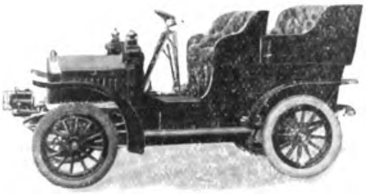
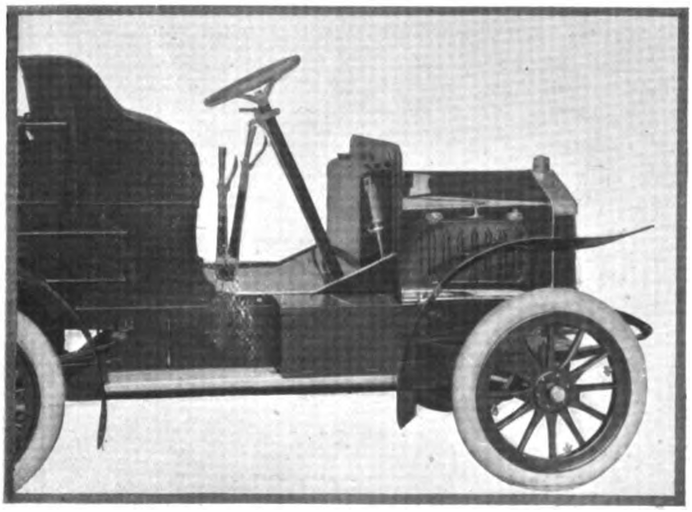
(No. 22).

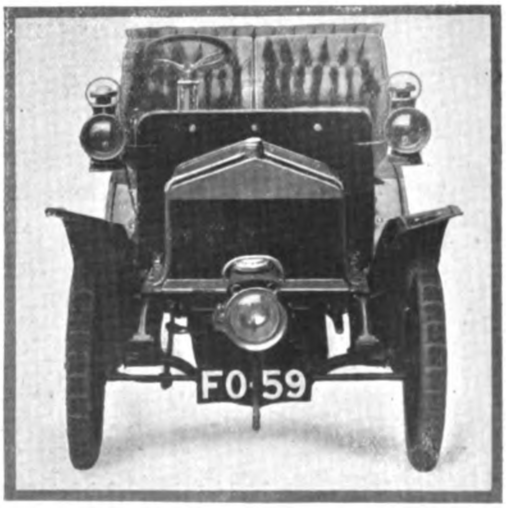
The Alldays

(BRITISH)

7, 8 & 10 H.P.

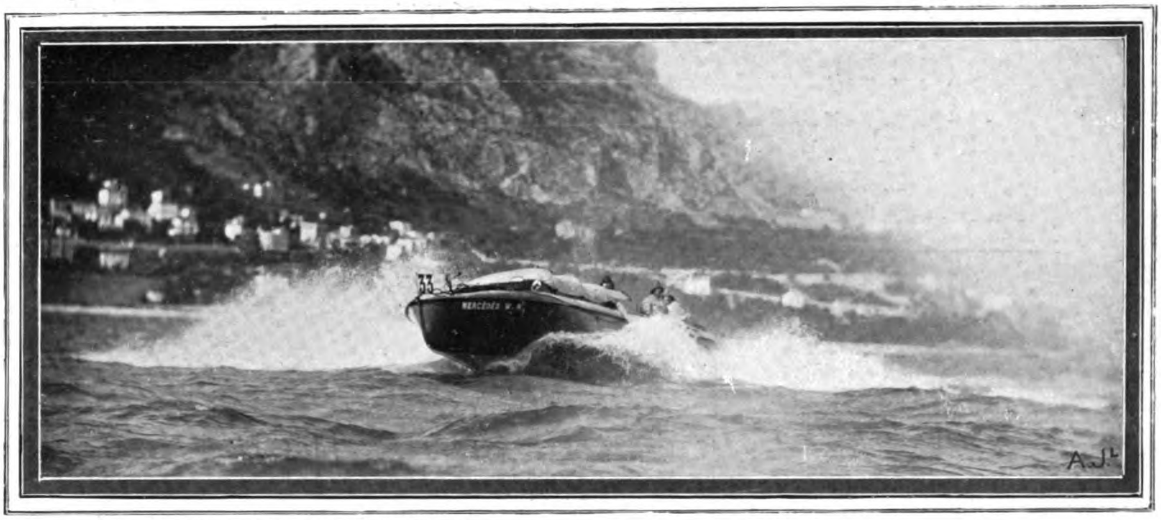




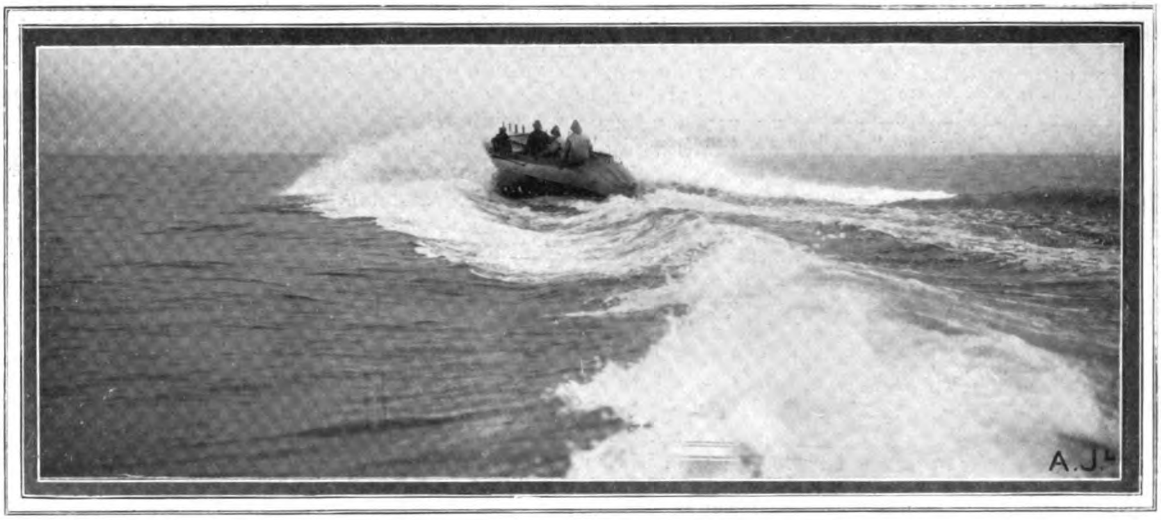


The RADIATOR, with its vertical tubes, surmounted by the TRIANGULAR TANK, forms an easily recognisable feature in front. Unusual, also, are the position of the PETROL TANK, which is carried on the dash, and the shape of STEERING-WHEEL ARMS

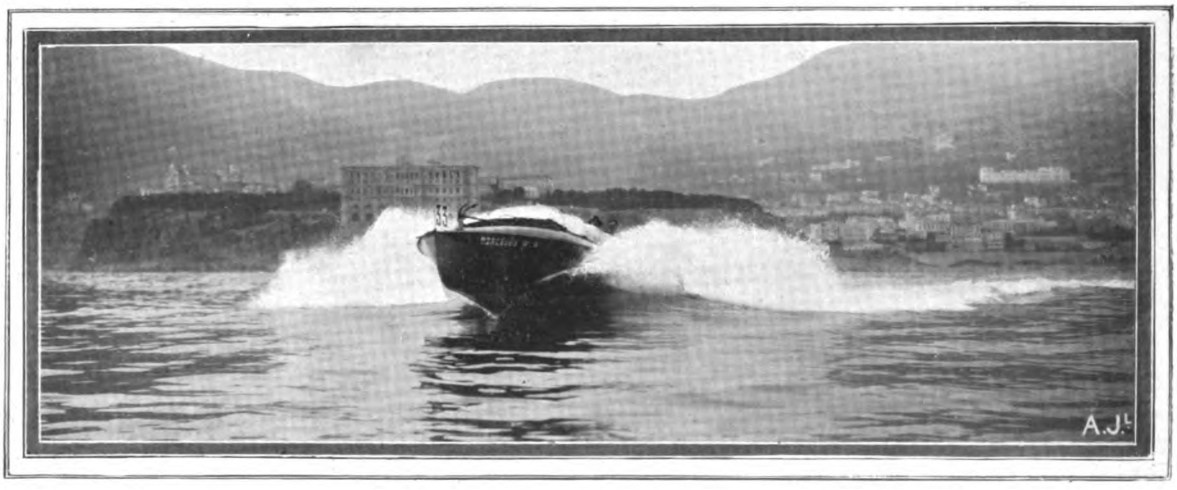
MONACO BOAT MEETING.



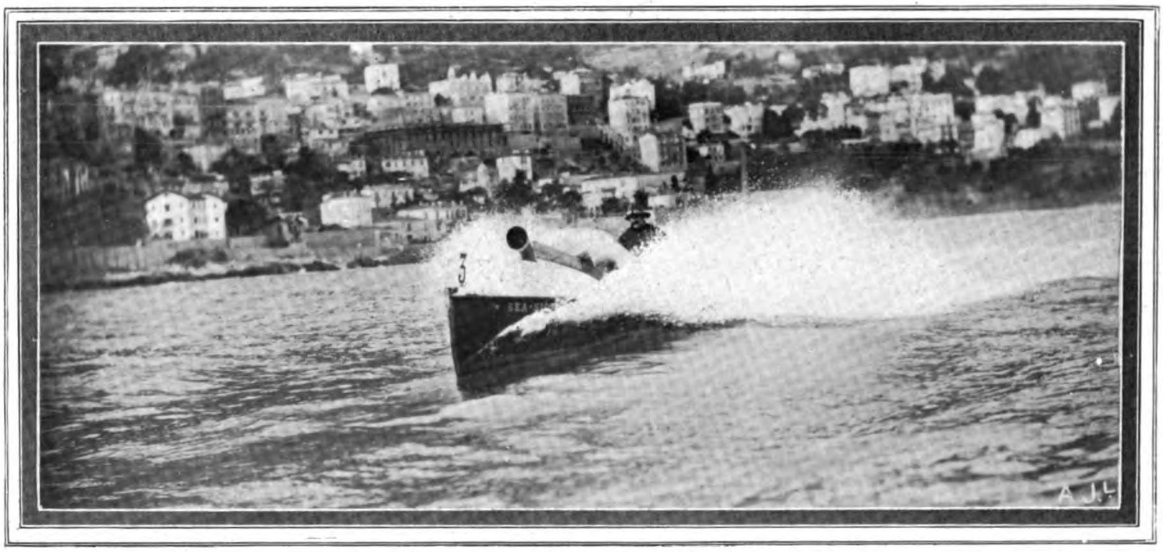
MONACO MOTOR BOAT MEETING.—In the above photograph, and those following on this and other pages of the current issue of "The Automotor Journal," some very interesting pictures are given of the racing craft which have taken part in the marine race meeting at Monaco last week. These photographs illustrate very markedly the varying effects of motor-boat design upon the water, when travelling at high speed. The photograph above represents "Mercedes W.N." at full speed in rough weather.



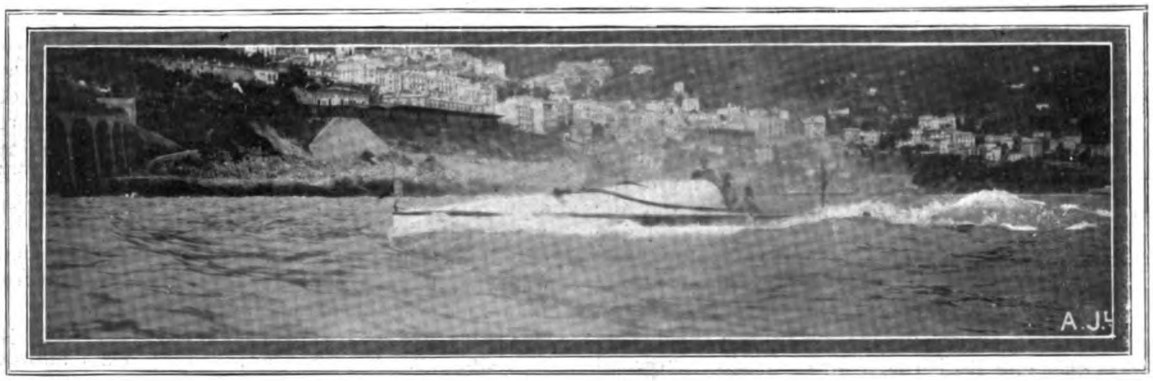
MONACO MOTOR BOAT MEETING.—"Mercedes W.N.," a stern view, showing her wash.



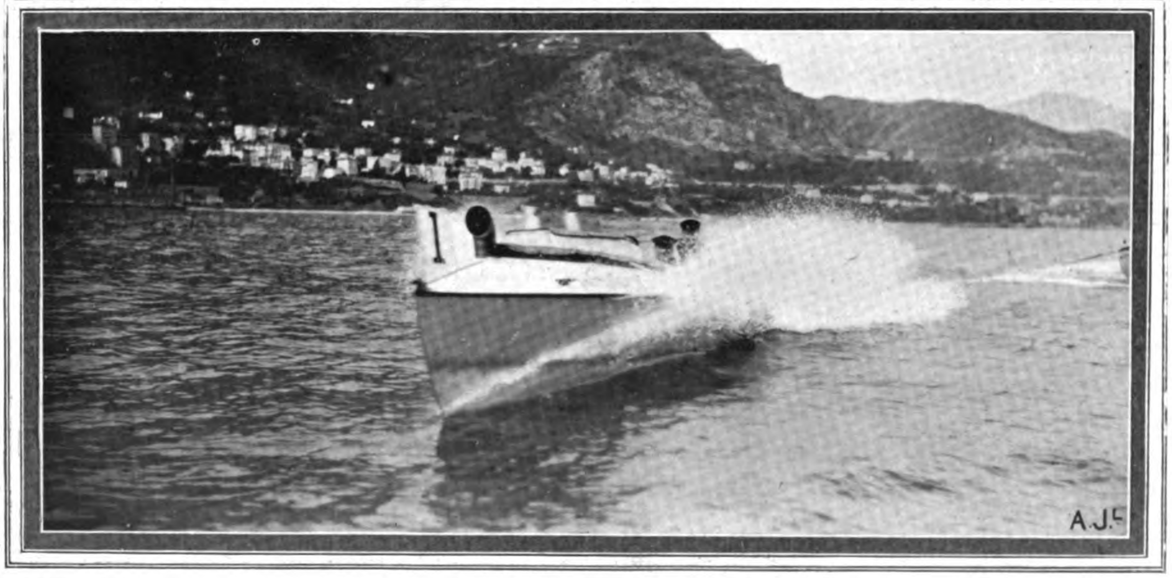
MONACO MOTOR BOAT MEETING.—"Mercedes W.N." cleaving her way through a calm sea. It is interesting to compare this picture with that at the top of this page



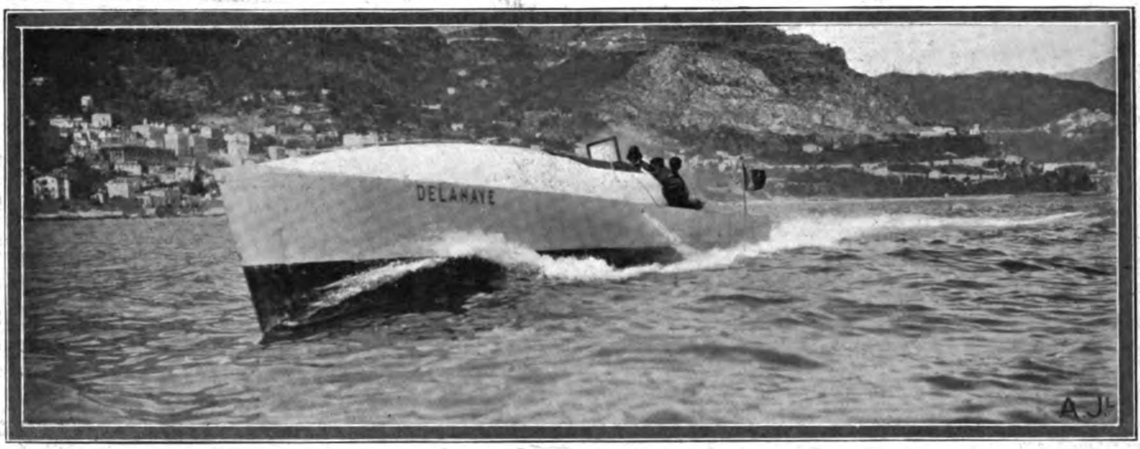
MONACO MOTOR BOAT MEETING.—Baron de Caters' Italian boat "Seasick" at speed throws up the spray sharply from the bow. Baron de Caters secured two world's records during the meeting, that for 50 kiloms. in 1h. 4m. 8s., and that for the flying kilom. (open sea) in 1m. 10s.



MONACO MOTOR BOAT MEETING.—"Siola," the Napier-Saunders British-built boat, entered by Mr. Lionel de Rothschild, which took part in the races last week, at full speed.



MONACO MOTOR BOAT MEETING.—"Antoinette IV" at racing speed. Winner in her class over the 50 kilometres in 1h. 9m. 23s.



MONACO MOTOR BOAT MEETING.—"Delahaye," the magnificent vessel which secured the Championship of the Sea Cup, and also won the event for the 60-foot racers.

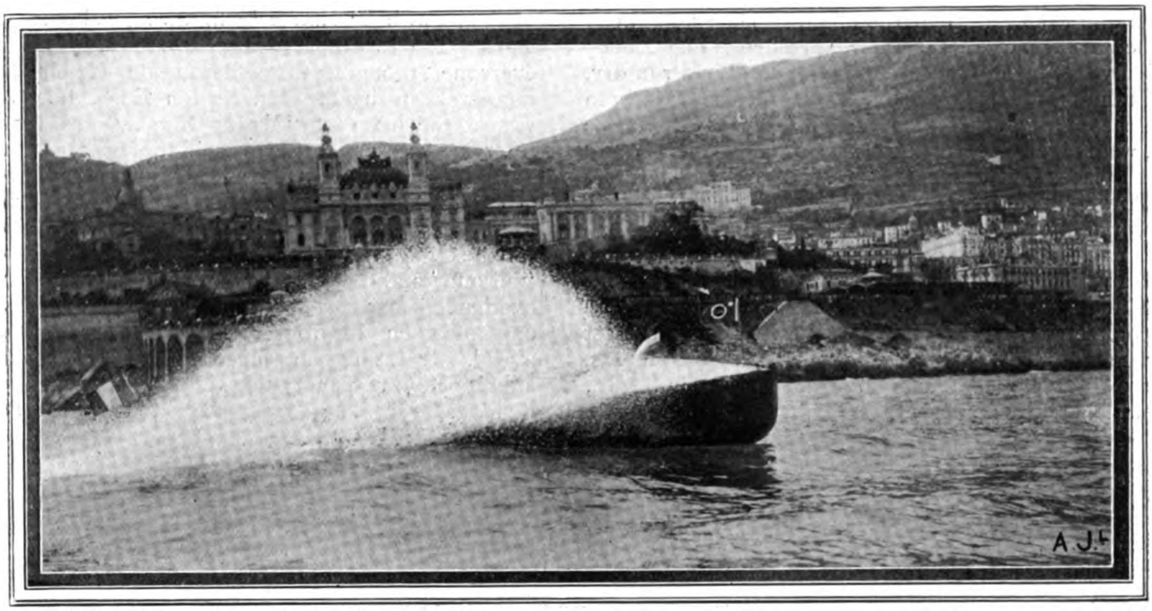
On Sunday, April 15th, the third annual meeting of motor boats—or as Mr. Filson Young terms them, "Mediterranean Tadpoles"—at Monaco came to an end. The general festivities started on the 4th inst., but racing did not commence until the following Sunday, when "Antoinette IV" won the less than 8-metre class for racers. On the next day, "Yarrow-Napier" provided the first British victory of the season by her success in the 12-metre class, this victory being obtained, as we pointed out last week, under excessively unfavourable weather conditions. Some little disappointment was felt at first, owing to the roughness of the sea preventing high speeds, but the weather cleared up on the Tuesday and remained fine during the remainder of the week, thus adding very materially to the general success of the meeting.

Cruisers from 8 to 12 metres and racers from 12 to 18 metres took part in the events of the third day. There was only one British boat—"Quicksilver," owned by Mr. J. M. Gorham, and fitted with a Daimler engine—in the cruiser class, but she was, unfortunately, not successful, for M. Crucq's boat, "Calypso," secured the race (50 kiloms.) in the splendid time of 1h. 28m. 23s. This gives a mean speed of 33·9 kiloms. per hour (21·1 m.p.h.), and is probably a record speed for this class of boat.

In the afternoon the 60-foot racers competed over the 50 kilometre course, and "Delahaye," with her powerful engines, gained an easy victory by completing the distance in 1h. 18m. 4s., against the 1h. 28m. $38\frac{3}{5}$s. taken by "Dubonnet." Following "Dubonnet" was the German "Mercedes," which finished in 1h. 31m. 48s., but the Austrian "Mercedes" abandoned the race after completing two laps. This victory is all the more noteworthy because "Delahaye" lost some two minutes at the start, while "Dubonnet" got away from the line at a high speed and was closely followed by the German "Mercedes." The other "Mercedes" was in the hands of a helmsman who unfortunately found some trouble in following the mark buoys, and she was not from the beginning a serious competitor in the race.

Wednesday was, as it has been in previous years, a semi-holiday. Cruisers and fishing boats afforded the only attraction, and as these latter especially are somewhat slow-moving vessels, the interest in the events was anything but intense. Nearly everyone not actually in these races was far more concerned with the preparation of the racing craft which were to take part in the great

MONACO MOTOR BOAT MEETING.—"Berliet VII" pounding through the seas.



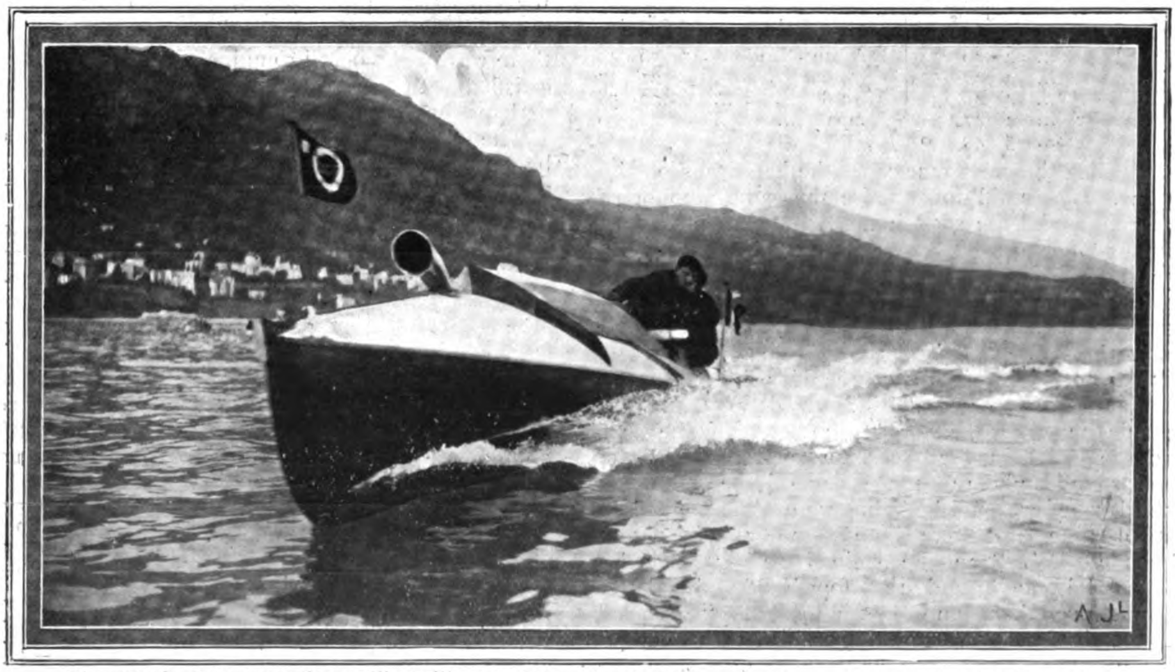
MONACO MOTOR BOAT MEETING.—"La Rapière" when turning at full speed.

championship race (Le Championnat de la Mer) on the following day. It was in the morning that the pinnaces and fishing boats had their trials, and these resulted in victories for "Dalifol III" and "Henriette" in the two classes respectively. All the competitors in these classes used paraffin, and the fishing boats had to make a journey from Monaco to Nice and back, while the pinnaces covered a distance of 20 kiloms. "Dalifol III" won her event in 1h. 17m. 27s., and was followed by "Alexandre"—the only other pinnace to finish—in 2h. 25m. "Henriette" occupied 3h. 2m. 37s. in making her return trip to Nice.

In the afternoon the cruisers competed over the 50 kiloms. course, and M. de Anchorena's "Pampa," which has Fiat engines, won an excellent race in 2h. 2m. 26s.—a mean speed of 24·5 kiloms. per hour. "Lorraine," which came in second in 2h. 19m. 35s., lost some 36 mins. over a magneto break-down, "Florentia" and "Fiat XII." being also *en panne* at the same time. After being repaired, "Lorraine" made a spirited attempt to get home first, and had actually made up three-quarters of a lap before being beaten by less than 8 mins.

Thursday was the great day of the week, for it was the occasion of the championship of the sea—a race for racers and cruisers alike over a distance of 200 kiloms.

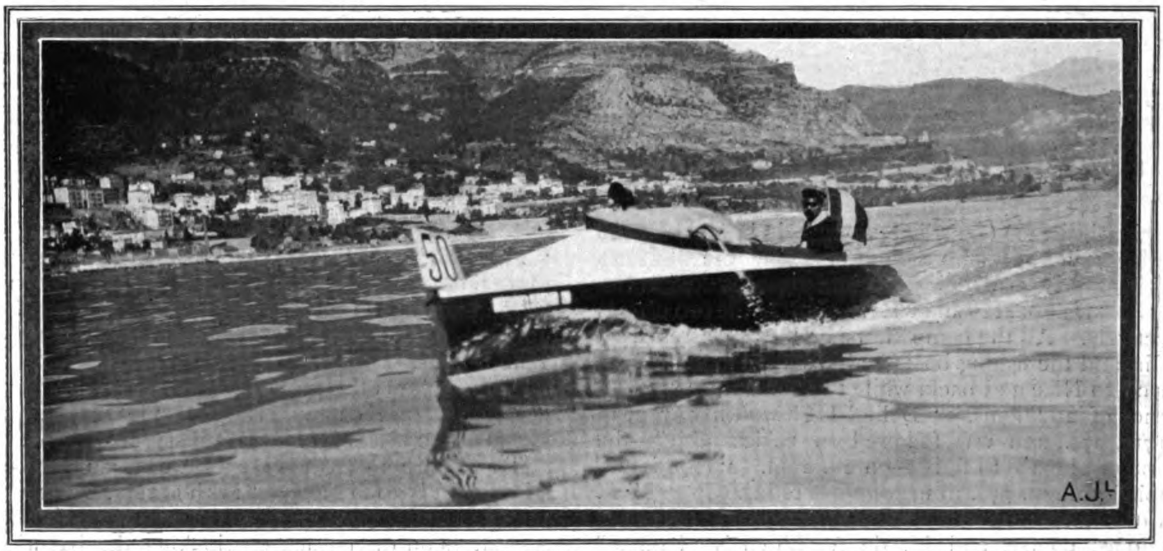
There were no less than 25 starters, and this in itself added greatly to the interest in the event, especially from the spectacular point of view. There were thousands of spectators on the terrace overlooking the bay and many of them so appreciated the event that they remained throughout the whole of the five hours which it lasted. The race itself, too, was exciting, for "Delahaye" and



MONACO MOTOR BOAT MEETING.—"La Rapière" coming down the straight at full speed.

"Fiat XIII" immediately took the lead and continued, first one in front and then the other, to keep well ahead for the greater part of the course. Then "Fiat XIII" suddenly stopped because her petrol tank had run dry, and in the short delay occasioned by replenishing it, both "Delahaye" and "Antoinette IV," the little 8-metre boat, were able to get ahead and eventually gain first and second places, respectively. "Fiat XIII" was not long in following, however, and she secured the third place, but only about a minute in advance of "Yarrow-Napier," which came in fourth.

On an average 14 mins. were occupied by "Delahaye" in making each round, and the full course (200 kiloms.) was completed in 4h. 40m. 12s. "Antoinette IV" lost the race by only 2m. 41s., and "Fiat XIII" by 6m. 25s. "Yarrow-Napier" completed the course in 4h. 47m. 38s., and was therefore only 7m. 26s. behind the winner.


A.J.

MONACO MOTOR BOAT MEETING.—"Mendelssohn II" travelling "all out."

The following table gives the times of those boats which finished the race.

Boat.	Time. H.	M.	S.
Delahaye	4	40	12
Antoinette IV ...	4	42	53
Fiat XIII ...	4	46	37
Yarrow-Napier ...	4	47	38
Vol-au-vent ...	5	49	0
Delahaye-Nautilus	5	56	45
Mercedes W. N....	6	21	47
Mercedes D. L. ...	6	29	58
Pampa	8	28	0

Succeeding the great race came the handicaps on the next day. These did not promise the same amount of excitement as did the scratch races, but they proved to be among the most interesting events of the meeting. From the British standpoint they were quite the most notable on account of the splendid performance of "Yarrow-Napier," by which she gained her second victory. Baron de Cater's little 8-metre boat, "Seasick," was "Yarrow-Napier's" chief competitor; she had started one minute behind, but almost immediately began to overhaul the larger boat. At the end of the first round she had gained 28 secs., and at the end of the second round only 14 secs. separated them. When the third round was finished they were almost equal in point of time, but were both some 5 mins. from "Mercedes D.L.," and 2 mins. from "Mercedes W.N." Half-way round the fourth lap the latter boat was overtaken, and just afterwards "Seasick" took the lead of "Yarrow-Napier." At the end of this lap both boats simultaneously overtook the German "Mercedes," and "Seasick" was thus ahead of all, with "Napier" following closely behind. Thus these two boats entered upon the last lap, and everyone thought that Baron de Caters had the race well in hand. Mr. Seaton Edge, however, who was at the helm ot "Yarrow-Napier," was very wisely reserving the greatest efforts of the boat until the last, owing to the damaged condition of the hull, resulting from her bad passage from England. It was not until the last buoy was rounded, and they were well entered on the straight run home, that Mr. Edge let the engines "all out," and then slowly and surely "Yarrow-Napier" overhauled her fast little rival, eventually passing her only a few lengths from the line, getting home 5 secs. ahead. It was a grand finish to a fine race, and it was additionally satisfactory that the honours were so equally divided, for while "Yarrow-Napier," with her Saunders hull and Yarrow-Napier engines, gained the prize, that popular French sportsman, Baron de Caters, with "Seasick," which has Itala engines and a French hull by Tellier, made a world's record for the distance. Thus there was jubilation all round, and everyone felt entirely satisfied with the event, which had provided what was perhaps the most sporting contest of the whole week.

The following table gives a summary of the times made by each competitor over the 50 kiloms. in this race:—

Boat.	Handicap allow. m.	s.	Time. h.	m.	s.	Speed. Kil. per hour.
Yarrow-Napier ...	1	0	1	5	3	46·1
Seasick	scratch		1	4	8	46·7
Mercedes D.L. ...	21	0	1	30	3	33·3
Mercedes W.N. ..	21	0	1	35	34	31·4

In the crusier handicap "Florentia IV" gained first prize, but "Calypso" again distinguished herself by making a record for her class of 1h. 22m. 12s. for the 50 kiloms. Fifteen boats finished, the first four arriving in the following order:—

Boat.	Handicap allow. m.	s.	Time. h.	m.	s.	Speed. Kil. per hour.
Florentia IV ...	58	0	2	15	0	22·2
Calypso	scratch		1	22	12	36·5
Extra-dry	41	0	2	4	12	24·2
Nihil	28	0	1	52	15	26·7

On Saturday, which in the ordinary course would have been reserved for the mile and kilometre speed-trials, a test was made with the object of ascertaining the real merit of the new rating rules drawn up jointly by the Yacht Club de France and the A.C. de France. These, it was proposed, should in future govern French marine events, but in view of the complete fiasco which signalised the preliminary trials held on Saturday, it would seem to be most unlikely that they will ever come into force in their present form, for it was very generally admitted that they are quite impracticable, however well they may meet the difficulties from a theoretical point of view.

These tests having occupied the Saturday, it was not, therefore, until Sunday, the 15th inst., that the meeting was brought to a conclusion by the mile and kilometre speed trials. "Fiat XIII" won the Prince of Monaco's Cup amid considerable enthusiasm. There were three heats, and in these "Seasick," "Fiat XIII," and "Delahaye" were the respective winners, the first named scoring a world's record (open sea) for the flying kilometre in 1m. 10⅗s. Baron de Caters' boat had a worthy rival in "Antoinette," but "Fiat XIII" had little trouble in beating "Yarrow-Napier," which was only running on one engine. In the final it was a close race between the two Italian engines, "Fiat" and "Itala." First to cross the starting line was "Seasick," but "Fiat XIII" kept close behind and just before the finish managed to overtake the smaller boat, and thus make a splendid victory.

The following are the times of the competitors in each of the heats and the final:—

	Standing Mile.		Flying Kilom.		Total.	
First Series (boats up to 8 metres).						
	m.	s.	m.	s.	m.	s.
1 Seasick	2	25⅖	1	10⅗	3	36
2 La Rapiere II ...	2	50⅗	1	26⅘	4	17⅖
Second Series (boats up to 12 metres).						
1 Fiat XIII.	2	32	1	11⅕	3	43⅕
2 Calypso	3	6⅕	1	36⅘	4	43
3 Yarrow-Napier ...	3	15⅗	1	33	4	48⅗
Third Series (boats up to 18 metres).						
1 Delahaye	2	42⅘	1	15⅕	3	58
2 Dubonnet	3	35⅘	1	31⅗	5	7⅖
3 Pampa	3	35⅗	1	43⅗	5	19⅕
Final (winners of the three series).						
1 Fiat XIII	2	25	1	11⅘	3	36⅘
2 Seasick	2	26	1	15⅘	3	41⅘
3 Delahaye	2	35	1	16⅘	3	51⅘

Paul Meyan Cup.

ON the day following the finish of the Monaco Meeting—Monday last—this event was down for competition. It resulted in a "sail over" for "Calypso," the Mors-engined boat. The course was 100 kiloms. between Nice—Antibes—Monte Carlo—Nice—Antibes—Nice, and "Calypso's" time was 3h. 2m. 33s.

MONACO MOTOR BOAT MEETING.—The two Mercedes boats at full speed, showing the different character of the "riding" of each craft.

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A Corner Worthy the Attention of the Surrey Police.

THE spot where the road from Weybridge to Cobham crosses the road from Walton, which joins the main Portsmouth road, is a very dangerous spot for traffic, and on Good Friday a lady, Mrs. E. Trimby, of Walton, who was being carried in a bicycle trailer, collided at this point with a motor car belonging to Lord Westbury, with fatal results. The driver of the car was exculpated by the coroner's jury. But this is the second fatal accident which has happened at this very spot, while another fatal occurrence in which a motor car was concerned took place only a short distance down the road a couple of years ago. It is a satire on our police methods to bear in mind that the elaborate police traps organised by Superintendent Marks are usually only about a couple of miles away from this dangerous corner, on the other side of Cobham, while another set of police traps are invariably arranged at about the same distance away on the Portsmouth Road. Never, however, do we recollect policemen being established for detecting actual "driving to the danger" of the public, or otherwise, at this very dangerous little triangle of roads.

Riding the Whirlwind.

SOME tramway enthusiast has been advocating a service along Piccadilly—Piccadilly of all places—of electric trams. The present conditions of the traffic there amount, he says, to a continuous "whirlwind" of motor 'buses, horse 'buses, and cabs, east and west, which never dare under any circumstances to stop. As regards the motor 'buses, there may be something in the whirlwind when the streets are clear and the police inattentive, but a "whirlwind of horse 'buses"—that certainly is a bizzare conception, on a level with "a charge of tortoises" or "a stampede of snails!"

THE HUMBER PETROL CARS.

FOUR AND SIX-CYLINDER MODELS.

(*Concluded from page* 455.)

Lubrication and Cooling.

LUBRICATION is a matter the importance of which has been fully realised by the Humber Company, and, as a result, they have adopted a system by which the oil is fed under direct pressure from a pump. For this purpose a small gear-wheel pump, T, is employed; its arrangement on the engine is clearly shown in Fig. 22. Close to it is another similar, but somewhat larger, pump, for circulating the cooling water, and it will be noticed that

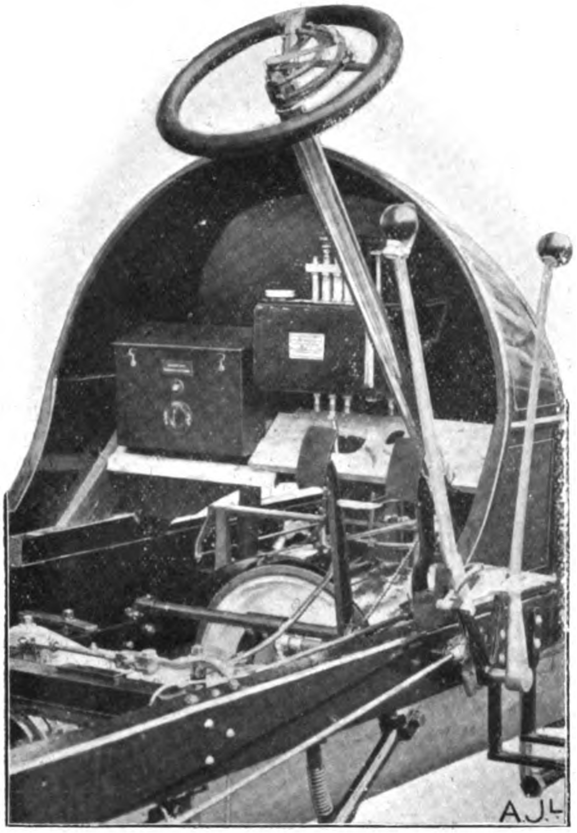


Fig. 19.—The 16-20-h.p. Humber Car. View of the dash, also showing the side levers and the quadrant for the change-speed lever. The "one-armed" steering wheel and the control levers above it are prominent in this view.

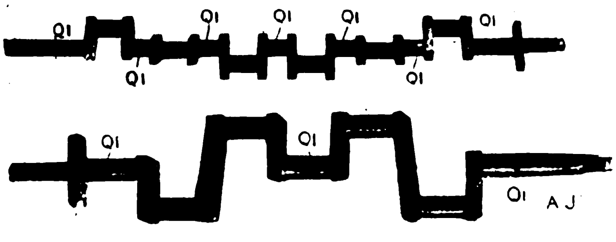


Fig. 21.—The 16-20-h.p. and 30-40-h.p. Humber Cars. Views of the crankshafts on the 4 and 6-cylinder models. There are seven bearings on the larger shaft and three on the smaller.

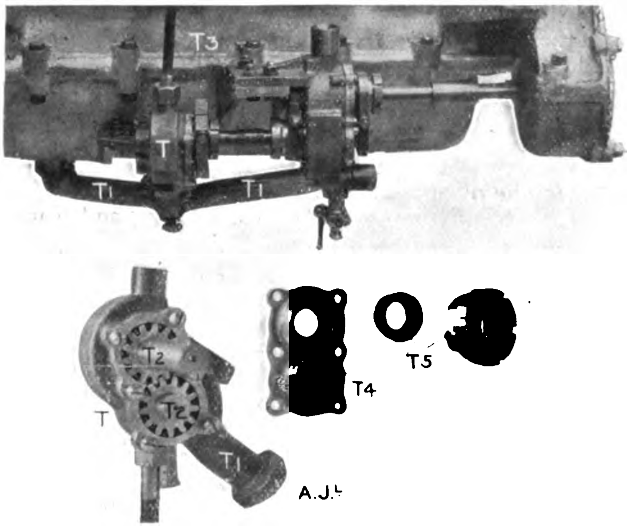


Fig. 22.—The 16-20-h.p. Humber Car. View of the oil and circulating pumps in place on the crank-chamber. Beneath is another view showing one of the oil pumps partly dismantled.

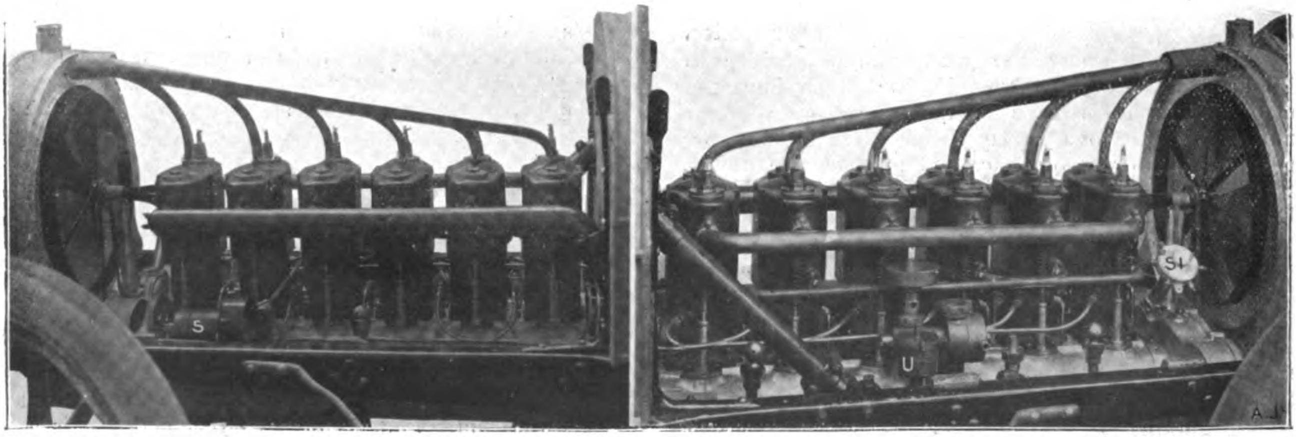


Fig. 20.—The 30-40-h.p. Humber Car. Views of the 6-cylinder engine in place on the chassis. A Krebs carburettor is fitted on this model, and the neat vent pipes, R^5, which are also used as oil funnels, are prominent in these views.

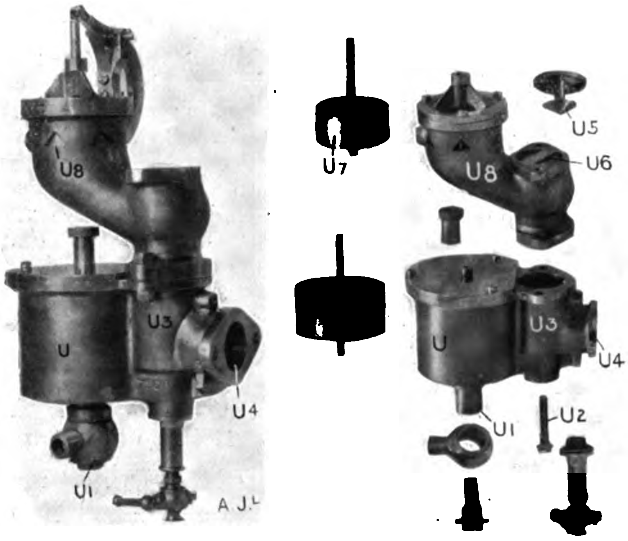


Fig. 23.—The 16-20-h.p. Humber Car. Views of the carburettor. On the left the apparatus is shown complete, and on the right the more important component parts are shown separately.

the power for driving the oil-pump is transmitted through the gear-wheels of the water-pump. In the lower part of Fig. 22 is a view of the oil-pump partly dismantled, in order to show its construction. Oil is drawn out from the base of the crank-chamber through the pipes, T^1, it enters the pump-chamber, T, and is there caught up by the teeth of the revolving gear-wheels, and carried through in two diverging streams. The two streams of oil meet on the delivery side again, and are then forced through the pipes, T^3, to the bearings. Quite independent of this system is another, which supplies oil direct to the cylinders from a force-pump on the dash. This lubricator is of the sight-feed type, but the mechanism, which is driven by belt from one of the cam-shafts, contains a force-pump which delivers the oil under pressure to the cylinder walls after the correct quantity has previously been measured out mechanically. It will be understood that the oil thus delivered constitutes a fresh supply to the crank-chamber, whereas that circulated by the gear-wheel-pump, T, is used over and over again. On the 6-cylinder car the direct feed to the cylinder walls has not been embodied because the stream of oil which is delivered by the gear-wheel-pump on to the connecting-rods for lubricating the big ends, is found to be sufficient for the purpose.

The circulating system for the cooling water calls for no special comment, for, as has been mentioned, the pump is of the same type as that used for the oil. As usual, the radiator forms the front of the bonnet, but although it has the appearance of being of the honeycomb type, it is actually composed of numerous flat corrugated tubes. Immediately behind the radiator is a belt-driven fan.

The Carburettor.

Views of the carburettor which is fitted to the 16–20-h.p. car, are given in Fig. 23. It is of the simple float-feed type, and is rendered automatic by an auxiliary air valve, which is also placed under hand control. Petrol enters the float-chamber, U, at U^1 until it reaches the level of the jet, U^2, in the mixing chamber, U^3. Air enters at U^4, and sprays the petrol against the stepped cone, U^5, the resultant "mixture" passing upwards to the induction-pipe-fitting which is attached at U^6. As the suction in the mixing chamber increases, a spring-loaded valve, U^7, uncovers ports, U^8, thus admitting auxiliary air direct to the induction-pipe, and so tending to keep the mixture correct. Should this valve become stuck up at any time, a hand-lever is provided below the steering wheel, by which it may be positively opened.

On the 6-cylinder engine a Krebs carburettor is fitted, but this is already too well known to our readers (*see* The Automotor Journal, January 10th, 1903), to need any lengthy description. Its general appearance is very clearly illustrated in Fig. 20. In principle it is similar to the carburettor just described, but the auxiliary-air-valve is attached to and operated by a flexible diaphragm enclosed in the flat cylindrical case which forms such a prominent feature of the apparatus.

Petrol is carried in a tank under the seat on the 16-20-h.p. car, but on the 6-cylinder car a special tank has been constructed which fits inside the cab dash. The steering column passes through this tank and there are absolutely no fittings of any kind attached to the front of the tank, which thus forms the dashboard.

Table of Reference Letters for the Humber Cars.

A	Axle casing.
A^1	Flange on A.
A^2	Nut on A.
A^3 and A^4	Ball races.
A^5	Piston sleeve between A^3 and A^4.
A^6	Leather washer.
A^7	Spring bracker.
A^8	Bracket for brake.
B	Hub.
B^1	Loose flange on B.
B^2	Driving socket.
B^3	Dust cap
B^4	Brake drum.
C	Live axle.
C^1	Outer nut on C.
C^2	Square end on C.
C^3	Hexagon inner end on C.
C^4	Bevel wheel on C^3.
C^5	Nut on C^3.
C^6	Sleeve over C^5.
D	Differential box.
D^1	Big bevel wheel.
D^2	Nut.
D^3	Ball race or D.
D^4	Thrust-bearings for D^1.
D^5	Spider carrying D^6.
D^6	Planet wheels.
D^7	Outer case of spring drive.
D^8	Springs for spring drive.
E	Spindle for E^1.
E^1	Bevel on end of propeller-shaft.
E^2	Ball race.
E^3	Thrust-bearing.
F^4	Case over E^2 and E^3.
E^5	Nut.
E^6	Hexagon end of E.
E^7	Spigot.
E^8	Ball race for E^7.
E^9	Nut on E^7.
F	Differential casing.
F^1	Bracket for E^8.
F^2	Torque rods.
G	Brake shoes.
G^1	Operating wedge.
G^2	Lever on G^1.
G^3	Spring holding brake shoes "off."
G^4	Pivot for G.
G^5	Brake shoes for foot-brake on differential.
G^6	Spindle operating G^5.
G^7	Pedal for G^5.
H	Gear-shaft.
H^1	Ball-bearing for H.
H^2, H^3, H^4	Gear wheels.
H^5	Jaw coupling.
H^6 H^7	Operating forks.
H^8, H^9	Sliding rods.
K	Clutch shaft.
K^1	Pinion on K.
K^2	Ball-bearings for K.
K^3	Sleeve over K^2.
K^4	Additional bearing for K.
K^5	Jaw coupling.
L	Lay-shaft.
L^1, L^2, L^3, L^4	Gear-wheels on L.
L^5, L^6	Ball-bearings for L.
M	Reverse pinion.
M^1	Operating fork.
M^2	Sliding rod.
N	Gate for change speed lever.
N^1	Lock on N.
N^2	Pedal for releasing N^1.
N^3	Spring for holding lever.
N^4	Spring catches for sliding rods.
P	Inner clutch member.
P^1	Springs for P.
P^2	Bolts for P^1.
P^3	Thrust ring.
P^4	Springs under leather.
P^5	Clutch pedal.
P^6	Dash-pot.
P^7	Valve on P^6.
Q	Crank Shaft.
Q^1	Bearings for Q.
Q^2	Flywheel.
Q^3	Pointer for setting cams.
R	Cylinders.
R^1	Crank-chamber.
R^2	Brass plates on R.
R^3	Cam shaft.
R^4	Tapered cams.
R^5	Vent to R^1.
S	Magneto.
S^1	Commutator for battery circuit.
T	Oil pump.
T^1	Suction pipe.
T^2	Gear wheels.
T^3	Delivery pipe.
T^4	Cover for T.
T^5	Stuffing box.
U	Carburettor float chamber.
U^1	Petrol connection.
U^2	Jet.
U^3	Mixing chamber.
U^4	Main air entry.
U^5	Spray cone.
U^6	Induction-pipe fitting.
U^7	Auxiliary air valve.
U^8	Ports for U^7.

The Frame.

Pressed steel side members are employed for the main frame, and these are narrowed together near the dash in order to secure a wider steering-lock for the wheels. On the 30–40-h.p. model they are also bent up slightly where they pass over the back-axle, and they are, in addition, brought together to a point at the extreme rear. This latter peculiar feature is adopted on account of the transverse spring, which is used in conjunction with the two side springs. Semi-elliptic side springs are used in front between the axle and the frame. On the 30–40-h.p. car the front axle is a solid forging and has knuckle ends instead of the inclined forks which characterise the tubular axle on the smaller vehicle. On both models the steering-gear is of the ordinary worm and sector type. An underframe is provided on the 16–20-h.p. model for the purpose of supporting the engine and gear-box, but this is dispensed with on the 6-cylinder car because the relatively greater width of the engine enables it to be supported directly by the main frame while the gear-box is supported from two of the cross-members.

THE DAIMLER COMPANY AND THE MOTOR UNION.

A GENEROUS GIFT.

THE following correspondence between the Daimler Company and the Motor Union has been forwarded to us for publication :—

29, Great George Street, W.,
April 9th, 1906.

To W. Rees Jeffreys, Esq.,
Secretary, Motor Union.

DEAR SIR,—As chairman of the Daimler Motor Company, I am authorised by the Board to inform you that they are disposed to make a contribution towards the work which has been undertaken by the Motor Union for the benefit of the automobile movement generally.

Having regard to the fact that the progress of the automobile industry depends so much on the protection which is accorded to the users of the automobile, it appears to the company that manufacturers, traders, and others engaged in the motor industry should, as far as possible, support the Motor Union by contributions, so as to enable it to develop its very successful work in the desired direction.

There is no doubt that the Union has been very successful in protecting the rights and extending the privileges of motorists, and, through its activities, increasing the number of those who use the motor vehicle, to the immediate benefit of the industry.

It has been suggested that the Motor Union Defence Fund is a fund which has peculiar claims upon the support of the manufacturers, and I shall be glad to learn whether the Union would be willing to accept a contribution from the Daimler Company of 100 guineas towards this fund.

With best wishes for the continued success of the Union,

Yours faithfully,
E. MANVILLE.

1, Albemarle Street, W.
April 10th, 1906.

To E. Manville, Esq.

DEAR SIR,—I beg leave to thank you for your letter of the 9th inst. It gives me very much pleasure to acknowledge the generous action of the Daimler Motor Company, and to state that the Motor Union will be very happy to accept a donation of 100 guineas towards the Defence Fund. The calls upon this fund are many and increasing. Unless, therefore, it is supported by automobilists generally, the Union will not be able to give that measure of support which it is anxious to render in cases brought before it. It may interest you to know what has been the expenditure within the past fortnight : –

March 28th.—The Union resolved to contribute the sum of £30 towards the appeal of a member against whom a High Court jury had awarded £1,500 damages for an accident which another jury held he was not responsible for.

March 28th.—The Union resolved to contribute half the costs of the successful defence of an Ipswich motorist, who, in their opinion, had been wrongly and vexatiously charged with driving to the danger of the public.

March 30th.—The Union resolved to pay half the costs of an appeal against a conviction for driving a car with an indistinguishable number plate, as all reasonable precautions had been taken.

March 30th.—The Union decided to refund to the Lincolnshire Club expenses incurred in defending a civil action on behalf of a member.

April 4th.—The Union organised the opposition to the application of the Harrogate Town Council for ten mile limits of speed in the borough, and paid one half the cost.

April 4th.—The Union undertook the defence (and briefed counsel) of a member of the public, Mr. Little, who, when warning a motorist of the existence of a police trap, was charged by the police at Croydon for obstructing them in the execution of their duty.

April 5th.—The Divisonal Court quashed a conviction of a bench of Magistrates, on the ground of bias and prejudice against motorists. The Union contributed £20 towards the cost of this case.

April 9th.—The Union resolved to grant £10 towards the cost of a successful appeal to Quarter Sessions against a conviction for alleged reckless driving.

It will be seen, therefore, that within a period of fourteen days the Union has made grants or expended money in eight legal cases, aggregating to upwards of £150, and in certain contingencies the costs in these cases may exceed £200.

In addition, legal information and advice has been given free to many other applicants.

The extent to which the Union can render financial aid in legal cases, and in defending the rights of motorists, must depend upon the support it receives from those who use motor cars or are interested in their sale or manufacture.

The Union is very glad to see that the Daimler Company recognises that the work which the Union undertakes establishes a claim upon the generosity of the firms engaged in the industry, and it is to be hoped that, in the interests of the movement, the action of your Company in this matter will be widely followed.

Yours faithfully,
W. REES JEFFREYS.

Road Experiments in Warwickshire.

SOME time ago we referred to experiments with various methods of road making being carried out in Kent. We are glad to see that the same subject is engaging the attention of local authorities elsewhere. Thus the Warwickshire County Council is arranging for somewhat similar experiments in a scientific manner between Stonebridge House and Packington Park, on the main road between Birmingham and Coventry. A length of 800 yards of this road has been set out twenty feet wide and provided with a good surface of slag to ensure a uniform camber throughout the distance in question. The 800 yards is to be then divided into six sections, each one of which will be made up with the following road materials :—

1. Mount Sorrel granite.
2. Hartshill stone.
3. Clee Hill stone.
4. "Tarmac."
5. Leicestershire granite.
6. Hartshill stone from a different quarry.

The main object of the county council is, as will be seen from the selection of materials, rather to obtain data on the relative cost of upkeep than to get rid of dust. Incidentally, however, the relative wearing power of "Tarmac" will be demonstrated, and this is a point of decided importance as regards the future of the dustless road.

THE CONNELL TYRE LEVER.

More and more attention is being given at the present day to the question of scientific tyre repair, and not the least important part of the outfit is of course the tool by which the tyre is removed or replaced. There are already several special devices on the market which have been designed to facilitate these operations, and the latest which have been added to the number is an invention of Mr. Connell of Gainsborough. Its primary object is the simplification of the process of placing a valve stem or security bolt in position, but the special tool designed for this work has been supplemented by two levers of the ordinary type so as to make the outfit complete.

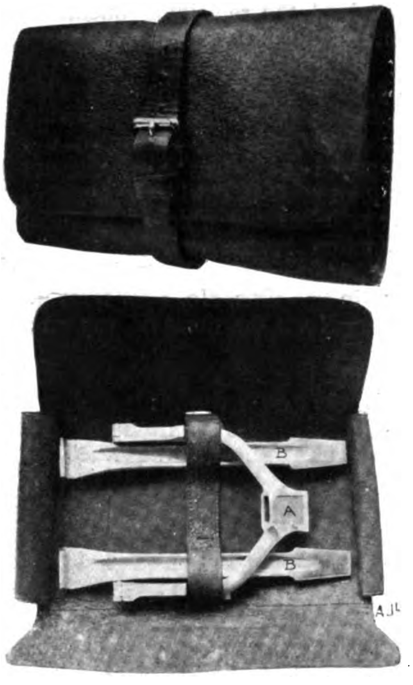


Fig. 1.—The Connell Tyre Lever. View of the wallet and of the three levers contained in it which forms the outfit.

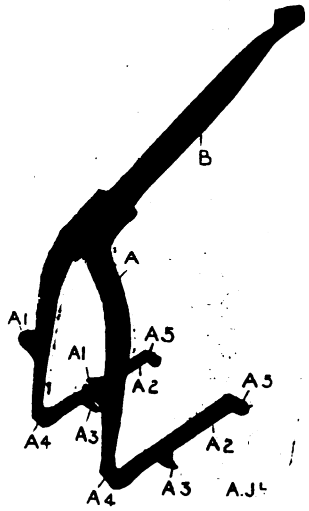


Fig. 2.—The Connell Tyre Lever. View of the forked lever, A, with its hinged arms, A^2, which forms the special feature of this outfit.

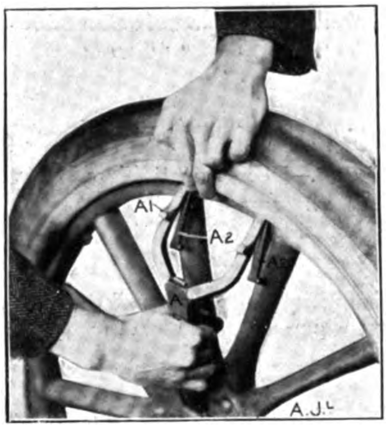


Fig. 3.—The Connell Tyre Lever. Illustration showing the forked lever being inserted under the near side beading preparatory to lifting it clear of the rim.

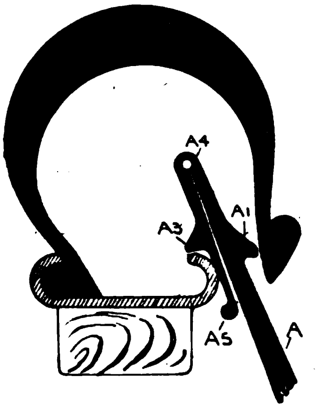


Fig. 4.—The Connell Tyre Lever. Diagrammatic drawing showing the first position assumed by the forked lever. The hinged arms, A^2, lie flat against the hooks, A^3, are engaged in the clinch of the rim.

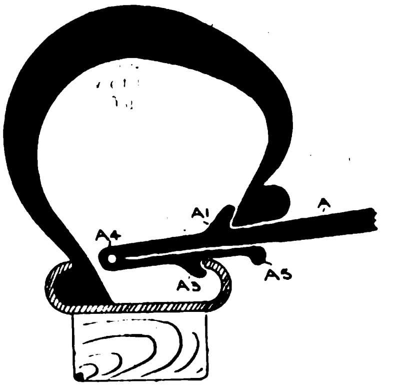


Fig. 5.—The Connell Tyre Lever. Sketch illustrating the second stage in the operation and showing the near side beading after it has taken its place in the hooks, A^1. It will be noticed that the elbow, A^4, is already approaching the far side beading with a view to keeping it firmly in place.

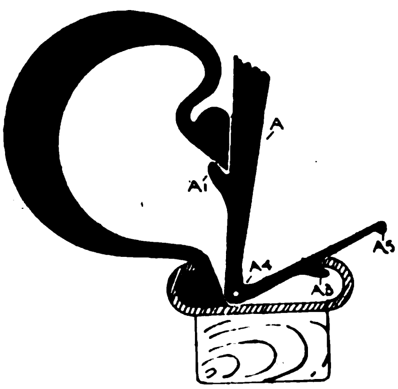


Fig. 7.—The Connell Tyre Lever. Drawing showing the lever in its final position and showing the elbow, A^4, up against the far side beading which it thus prevents from slipping out of place.

It is, however, to the use of the forked lever, A, that most interest attaches, for it has been designed so that it will not only raise the near-side beading clear of the rim, but hold the far-side beading securely in its clinch at the same time. In this way it prevents this beading slipping out at the critical moment and covering up the valve-hole in the rim just as everything is ready to insert the stem. Our illustrations—especially the line drawings Figs. 4, 5, and 7—show the action of this device in a very graphic manner. Of these, Fig. 7 shows the special feature referred to above most clearly; the other views illustrate various stages in the manipulation. The forked lever, A, has, it will be noticed, hinged arms, A^2, and both the rigid and the hinged members have hooks, A^1 and A^3 respectively, forged solid with them. At the middle of the fork is a slotted boss which receives one of the levers, B, as shown in the photographs Figs. 2, 3, and 6.

It is, of course, these supplementary levers which are used in the initial operations, the forked attachment only

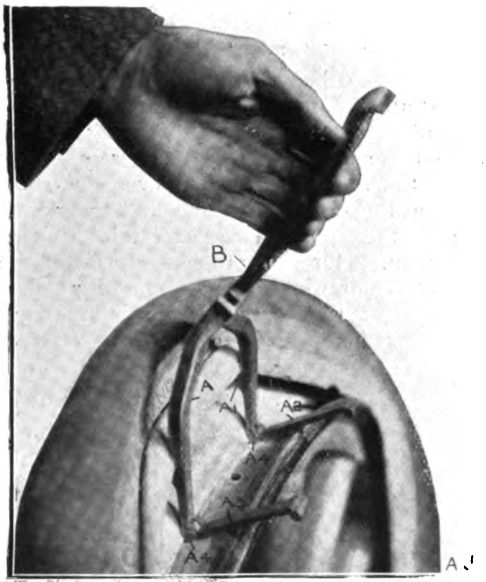


Fig. 6.—The Connell Tyre Lever. Photograph showing the final stage of the operation, and illustrating how the lever lifts the cover quite clear of the hole in the rim, thus rendering the insertion of a valve stem or security bolt a very simple matter.

coming into play when all the tube, excepting only that part which is attached to the valve stem, has been withdrawn from the rim. The distance between the forks enables the loose tube to be kept out of harm's way while the lever is being inserted, as shown in Fig. 3. During this process the hinged arms, A^2, lie flat against the fork, and they are pushed up into the tyre until the hooks, A^3, catch in the clinch of the rim, as shown in Fig. 4. Once this position has been attained, the remaining operation is one simple movement made by a continuous upward motion of the lever, B. This brings the lever into the position shown in Fig. 5, where the outer beading slips into the hook, A^1, and afterwards into the final positions shown in Figs. 6 and 7. Here it will be seen that the hinged members have opened out so that they lie across the rim, and the elbow joint at A^4 is, it will be noticed, close up against the far side beading which it keeps in place. This latter function is, as we have already pointed out, the special feature of Mr. Connell's invention. The lever is made in two sizes, No. 1 for tyres up to and including 90 mm, No. 2 for those of 105 mm. and upwards.

We have made a brief test with the lever and have found it very satisfactory for the work it is designed to perform. Mr. Connell has already introduced one minor improvement on the lever actually illustrated, by grooving the prongs, A, so that the arms, A^2, can be flush in the recesses. This makes it easier for the device to be manipulated when inserting it or withdrawing it from the cover, and it also gives the lever a neater appearance.

* * *

The Harrogate Application for the 10-Mile Limit.

It is to be hoped that the fact that a provincial town can boast among its permanent attractions a number of elderly ladies systematically and frequently propelled about its streets in bath chairs, will not be permitted by the Local Government Board to constitute an adequate reason for reducing the speed of automobiles in such a place to ten miles an hour. But this appears to be the only argument which the urban authorities at Harrogate had to bring forward in support of their application, which was heard before Mr. E. F. Willis, as representing the Local Government Board, at the Town Hall at Harrogate recently. In the inquiry the Motor Union and the Automobile Club were, as usual, represented by Mr. Rees Jeffreys, who also acted for the Yorkshire Automobile Club, while Mr. Titley represented the Harrogate Club. In cross-examination Mr. Rees Jeffreys elicited the fact from the police that no fatal accidents or serious injuries of any kind had occurred as the result of motor car accidents, and no official report had ever been made that the police were unable to control the motor car traffic, or that the powers enjoyed by them under Section I. of the Act had ever been found inadequate. But the Mayor stated that he thought that the speed of motor cars in the streets ought to be restricted, that 10 miles an hour was a very good speed, *and* that there were a number of visitors in summer who had to be taken about in bath chairs. He did not, apparently, connect these statements causally, but it was obvious that they were connected in his mind, and also in that of the medical officer, who said that if the motor car speeds were not limited, thousands of visitors (presumably in bath chairs) would be driven away. Mr. Rees Jeffreys had not much difficulty in "making hay" of these arguments. "Harrogate was a fine modern town, with wide streets and houses usually only on one side of them. In fact, there was not a town where application for the 10 mile limit had been made with less show of reason, and it was the first case in which such an application had been made merely for the convenience and comfort of the inhabitants of a town and its visitors." The application has peculiar features, for if the bath chair is allowed to impose a 10 mile limit on the automobile in this instance, every seaside resort and several other inland bath-chair towns will undoubtedly be entitled to follow suit.

Motor 'Bus Driving in London.

Another instance of the combined action of police and Metropolitan Magistrates in the good cause of stopping racing between rival motor 'buses, is afforded by two cases which came before Mr. Paul Taylor at the Marylebone Police Court last week. In all, two motor 'bus drivers were fined £5 and £3 respectively, the former being charged with proceeding along the Maida Vale at a rate of 16½ miles an hour. John Harris set up in his defence that it was impossible for his 'bus to travel more than 12 miles an hour, because it was provided with an automatic governor which prevented such an excessive speed, and could not be manipulated. In the face of the police evidence, the magistrate did not place much reliance upon the mere statement of the effect of this automatic governor, and convicted, with the result named above. The second driver, Charles Bacon, was fined £3 for driving on the wrong side of a refuge in the High Street, Kilburn, and very nearly running over a woman by doing so. On the whole, we think the value of the penalties ought to have been inverted, for of the two offences that of driving on the wrong side of a refuge is considerably more dangerous than driving a little above 12 miles an hour.

AERONAUTICS.

The Brothers Wright's Official Communication.

IF there are still any sceptics in this country in regard to the reality and *bona fide* character of the Wright Brothers' performances, chronicled by us in our issues of Dec. 9th and Dec. 30th, 1905, their scepticism should be finally and completely removed by the report which the Wrights have made to the Aero Club of New York, and which has been communicated by that body to the Aero Club of Great Britain. As the report will probably be in future regarded as the most epoch-making publication in the whole history of aerial navigation, as the absolute truthfulness of the authors is obvious in the wording of practically every statement the document contains, and as the execution of the flights referred to has been witnessed by some seventeen independent people of good position varying from bank managers to census officials, whose names and addresses are given, we make no apology for reproducing the Wrights' report in their own words :—

"Previous to the year 1905 we had experimented, at Kitty Hawk, North Carolina, with man-carrying gliding machines in the years 1900, 1901, 1902, and 1903, and with a man-carrying motor flyer, which, on December 17th, 1903, sustained itself in the air for fifty-nine seconds, during which time it advanced against a twenty-mile wind a distance of 852 feet.

"The object of the 1905 experiments was to determine the cause and discover remedies for several obscure and somewhat rare difficulties which had been encountered in some of the 1904 flights, and which it was necessary to overcome before it would be safe to employ flyers for practical purposes.

"Owing to many experimental changes in the machine and the resulting differences in its management, the earlier flights were short, but toward the middle of September means of correcting the obscure troubles were found, and the flyer was at last brought under satisfactory control. From this time forward almost every flight established a new record."

In the following schedule the duration, distance, and cause of stoppage are given for some of the later flights :—

Date, 1905.	Distance.	Time.		Cause of Stop.
		m.	s.	
Sept. 26 ...	17,961 m. ($11\frac{1}{8}$ miles) ...	18	9	Fuel exhausted.
,, 29 ...	19,570 m. (12 miles) ...	19	55	Fuel exhausted.
,, 30 ...	—	17	15	Hot bearing.
Oct. 3 ..	24,535 m. ($15\frac{1}{4}$ miles) ...	25	5	Hot bearing.
,, 4 ...	33,456 m. ($20\frac{3}{4}$ miles) ...	33	17	Hot bearing.
,, 5 ..	38,956 m. ($24\frac{1}{5}$ miles) ...	38	3	Fuel exhausted.

"It will be seen that an average speed of a little more than thirty-eight miles an hour was maintained in the last flight. All of the flights were made over a circular course of about three-fourths of a mile to the lap, which reduced the speed somewhat. The machine increased its velocity on the straight parts of the course, and slowed down on the curves. It is believed that in straight flight the normal speed is more than forty miles an hour. In the earlier of the flights named above, less than six pounds of gasolene was carried. In the later ones a tank was fitted large enough to hold fuel for an hour, but by oversight it was not completely filled before the flight of October 5th.

"In the last three years a total of 160 flights have been made with our motor-driven flyers, and a total distance of almost exactly 160 miles covered, an average of a mile to each flight, but until the machine had received its final improvements the flights were mostly short, as is evidenced by the fact that in the flight of October 5th a total of 29·7 circuits of the field was made. The times were taken with stop-watches. In operating the machine it has been our custom for many years to alternate in making flights, and such care has been observed that neither of us has suffered any serious injury, though in the earlier flights our ignorance and the inadequacy of the means of control made the work exceedingly dangerous.

"The 1905 flyer had a total weight of about 925 pounds, including the operator, and was of such substantial construction as to be able to make landings at high speed without being strained or broken. From the beginning the prime object was to devise a machine of practical utility rather than a useless and extravagant toy. For this reason extreme lightness of construction has always been resolutely rejected. On the other hand, every effort has been made to increase the scientific efficiency of the wings and screws in order that even heavily-built machines may be carried with a moderate expenditure of power. The favourable results which have been obtained have been due to improvements in flying quality resulting from more scientific design and to improved methods of balancing and steering. The motor and machinery possess no extraordinary qualities. The best dividends on the labour invested have invariably come from seeking more knowledge rather than more power."

The Purchase of the Wright Aeroplane.

THE proposed arrangement by which a French syndicate were to acquire all rights regarding the Wright aeroplane, with a view to presenting or disposing of them to the Government of France, has been months ago referred to in THE AUTOMOTOR JOURNAL. Mr. Fordyce, it will be recollected, who acted for the syndicate, actually paid down 25,000 fr. to the Wright Brothers for an option in their machine. A rumour is now current to the effect that the period of the option has expired, and that the syndicate were not ready with the purchase money. If this be the case, the Wrights will, of course, retain the £1,000, and be free to negotiate with any other prospective purchasers. As a matter of fact, it is stated that a group of American capitalists have combined to offer the Wright Brothers considerably more advantageous terms than those proposed by the French syndicate. As to whether these terms have been accepted, however, nothing has as yet transpired. Should the rumour to which we refer above prove correct, the chances of seeing the wonderful aeroplane sailing through the atmosphere of Europe would seem more remote than ever, unless the two experimenters determine to compete for the Deutsch-Archdeacon Prize, about which they do not appear to have hitherto displayed any anxiety.

The Barlatier and Blanc Aeroplane.

VERY satisfactory experiments with the Barlatier and Blanc model aeroplane are announced from Marseilles. This machine, to which we referred some months ago, is of the single aerocurve type (*i.e.*, there are no superposed aerocurves as on the Wright machine) with a rather complicated tail some distance behind. It is actuated by two propellers (or tractors) in front, and was first of all driven by a 1-h.p. motor, which for the recent experiments was replaced by a 2-h.p. Buchet motor. The model is said to have behaved with wonderful reliability, and to have sailed a considerable distance on a perfectly "even keel." The inventors are now proceeding to build a large machine of ten metres span, to be propelled by a 12-h.p. Buchet motor, and this they anticipate will be capable of carrying an effective load of quite its own weight.

Amateur Ballooning in U.S.A.

A CURIOUS feature of ballooning in the United States has been that hitherto it has been entirely in the hands of professionals. In marked contrast to the state of affairs prevailing in France and Great Britain, the amateur balloonist is a rarity that has only just begun to exist. This is the more remarkable as in the heavier-than-air type of flying machine America has accomplished so much. Now, however, this is all going to be altered, and a club of amateur balloonists has been formed. The first ascent was made recently by Dr. Thomas, in company with Count de la Vaulx. Dr. Thomas compared the feeling produced by ballooning to the condition of *Nirvana*, and also declared his ascent had been made for the honour of America.

A New Source of Hydrogen.

It is reported from Paris that a new method of obtaining hydrogen from a substance termed "hydrolithe," which is said to look something like carbide of calcium, is likely to prove of considerable use for navigable airships and balloons. At present the substance is somewhat expensive, costing as much as four shillings per pound, and of course its general utility will depend upon the possibility of reducing the price in future. A most important aspect of the new invention or discovery, whichever it may turn out to be, however, is that it will provide portable means of inflating balloons at any point. Hitherto the necessary apparatus for generating hydrogen for this purpose has weighed at least 7,000 lbs. The necessary hydrolithe apparatus will not, it is anticipated, exceed 1,000 lbs. in weight.

* * * *

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THE "HEDGELAND" SOLID AXLE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Verily there is truth in the old adage, "There is nothing new under the sun." The compound clutch driving gear now being exploited under the name of the "Hedgeland" solid axle was invented by me nearly a quarter of a century ago—to be exact, in the year 1882—and formed part of the subject matter of letters patent, No. 5307, granted to me in that year. The device was designed to give a double drive to velocipedes in both directions to compete with the differential gear on which Starley claimed a royalty under his patent.

Yours faithfully,
April 12th. ROBERT E. PHILLIPS.

[We give an illustrated description of Mr. Phillips' invention on page 491.—ED.]

SCOTTISH FLOTATIONS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—It has come to our knowledge that a number of people have subscribed to the All British Car Company, Limited, of Glasgow, on the understanding that it was the New Arrol-Johnston Car Company, Limited, who were floating their business. We regret that this should have been so, as we have absolutely no connection with the All British Car Company, Limited, and the use they made of our name in their prospectus was done without our permission, and, in any case, merely went to show that Scotland was not backward in the production of good cars.

Yours truly,
For the NEW ARROL-JOHNSTON CAR CO., LTD.,
JOHN S. NAPIER,
Paisley, April 11th. Managing Director.

POLICE PROTECTION (?).

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Will you kindly allow me to draw attention to the serious danger to which the public are exposed owing to the peculiar manner in which the police interpret their duties under the Motor Act, especially in Surrey?

The sad accident near Cobham, on Good Friday, furnishes a tragic illustration of the effect of this policy.

Lord Westbury's car, turning slowly into the Ripley Road, at Pain's Hill, unhappily met a bicycle with a trailer. The lady in the latter was thrown out and instantly killed. No blame attached to Lord Westbury. The parties responsible were the local police, who failed to make any attempt to regulate the traffic at this most dangerous point. Our cyclist patrol was on duty there doing his best to safeguard the travelling public.

Where were the police? Disguised in plain clothes, hiding behind a hedge at the foot of the hill. *After* the accident they emerged, and, of course, rendered what assistance they could. I need not analyse their motives in thus concealing themselves; they will be obvious to every right-thinking person.

To quote Lord Westbury, "My opinion is that, for the safety of the public on holidays, the police would be much better employed in being stationed at these dangerous places, instead of lying in ambush to catch motorists going a little bit too fast. A great deal of good might be done in that way."

The whole truth of the matter is that the police, instead of attempting to regulate the speed of motors, practically encourage breaches of the law. Hiding in private gardens, behind hedges, &c., they leave an apparently open road for the unwary motorist, hoping to lure him into a technical violation of the Motor Act. In short, *fines* are the one aim and object of the police. The public safety is utterly disregarded, the roadside villages are stripped of their police and left unprotected, the rush of holiday traffic is allowed to disentangle itself as best it may, and it is only by marvellous luck that accidents are not more numerous.

Acting on behalf of a large section of motorists, the Automobile Association is doing everything possible to remedy this state of affairs, and one may hope this sad fatality will awaken the authorities to a proper sense of their obligations.

I am, Sir,
Your obedient servant,
STENSON COOKE,
April 17th. Secretary Automobile Association.
18, Fleet Street, E.C.

* * * *

Another Railway 'Bus Bill.

ANOTHER railway company, the L.B.S.C. Railway, is promoting a Bill before Parliament to empower them to run services of motor 'buses to and from their stations. This has been agreed to by the Parliamentary Committee considering the Bill, with the insertion of the proviso:—That in the administrative county of London the Company shall only convey parcels or merchandise which have been or are to be, conveyed over some part of the railways owned, worked, or used by the Company, either alone or jointly with any other company. This is designed to prevent established "carrying" interests in the Metropolis from being prejudicially affected.

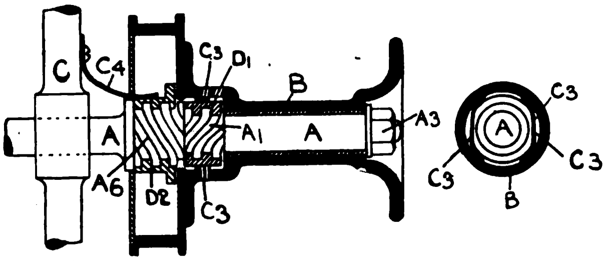
Provincial Motor 'Busishness.

MOTOR 'bus activity in the provinces is progressing most favourably, and it is satisfactory to observe that the Eastbourne Corporation, who were one of the pioneer municipalities to adopt the motor 'bus, have been applying to the Local Government Board to sanction further expenditure for the purpose of purchasing further motor 'buses to run in the borough. The Board have already sanctioned the additional expenditure of £3,340 for motor 'buses, though it is noteworthy that as regards the proposal to purchase two single-decked omnibuses, the Local Government Board stated that in their opinion further enquiry would be necessary.

The motor 'bus service between Bristol and Bath has developed to such an extent that it is now possible, according to a paragraph in the *Bristol Times and Mirror* of the 3rd inst., to make the whole journey either by tram or motor bus in either direction.

THE PHILLIPS FREE-WHEEL HUB AND THE HEDGELAND AXLE.

It is one of the most interesting features in connection with modern inventions that someone else has nearly always invented a more or less similar device previously. Happily for our generation, however, most mechanical principles of a fundamental character are as old as the proverbial hills, which only leaves their precise application available as subject matter for a patent. Mr. Hedgeland's free-wheel hub, which we described and illustrated in our last issue, is an ingenious use of the screw and nut of Archimedes modified to drive the modern motor car, and when describing this device we referred to the Green and Houk hub as one example of the application of the same principle for a somewhat similar purpose on a bicycle. As we pointed out at the time, the requirements in that case were, however, essentially different.



We have now received a letter from Mr. R. E. Phillips, which we publish in our correspondence columns this week, in which he refers to a similar invention of his own taken out twenty-four years ago! In this, the same principle was applied successfully to a tricycle, and its interesting feature lies in the fact that the mechanism was so devised that it could propel the vehicle both forwards and backwards. This, it will be remembered, was not a feature of the bicycle hub referred to last week, because reversing is not required on such machines. In Mr. Phillips' invention, a sectional drawing of which we reproduce, there were two separate nuts, D^1 and D^2, on two separate threads, A^1 and A^6, left and right handed respectively, on each end of the axle. The nut, D^1, was used for driving forwards, and the nut, D^3, for reversing, but in both cases the clutch action induced the same strain in the axle itself, because when going in either direction the hub was jammed tightly up against the nut, A^3, on the end of the axle. As in the Hedgeland case, the strain on the axle is, of course, purely local inside the hub.

Mr. Phillips was evidently fully alive to the necessity of providing friction-brakes for the nuts, and of the importance of the stationary member, C—in this case the bicycle frame—in clutches designed both to "free-wheel" and reverse. It is very interesting to note, however, that only one of the two nuts, D^2, was thus "anchored" frictionally to the frame by the spring, C^4, and that the forward driving-nut, D^1, was only "anchored" to the hub itself by the springs, C^3. Had the reversing nut, D^2, been held in a similar manner by the hub, the "free-wheel" action would have been destroyed, and it is interesting to notice that, conversely, there is no tendency for this machine to "run away" backwards on a hill.

Mr. Phillips also states in his specification that his invention can be applied to a bicycle, and presumably the "reversing" nut is then retained in order to permit back-pedalling.

As an interesting example of how difficult such early patents as these are to find, even by an expert search, it may be mentioned that this is the second of seven separate and distinct inventions—among which is a new pedal, a luggage carrier, and an automatic bell—filed under one patent, entitled "Velocipedes, &c." The reference letters on the above illustration correspond, as far as possible, to those used by us on the Hedgeland Axle illustrations last week.

⊗ ⊗ ⊗ ⊗

American Motor Lifeboats.

The advantages of motor propulsion for lifeboat service seem to be receiving almost more complete recognition in the United States than even in this country, and the "United States Life Saving Service," which, sensibly enough, is a Government institution, the work not being left entirely to private enterprise as in this country, have now some 50 motor-propelled lifeboats in commission. The little craft are very compact, being only 34 ft. in length, 8 ft. in beam, and having a draught of 3 ft. In general appearance the boats much resemble our own build, except that they are smaller. A very useful addition is that the fore hurricane deck can be prolonged by a sort of protective hood so as to cover in the greater part of the boat. Both forward and aft at the extreme ends of the vessel are water-tight bulkheads with 82 copper air-chambers, shaped to fit the spaces they occupy. The air-chambers thus constructed possess sufficient buoyancy to render the vessel insubmersible, and contribute to its buoyancy by preventing either bows or stern sinking too deeply in the water. What may be called the working deck of the vessel is situated above the waterline, and the deck surface communicates with the exterior by ten 6-inch copper tubes, which are fitted with valves so that any water shipped will immediately run out through them, though no water can enter the boat by the same means. The lifeboat is rendered self-righting by the action of the air chambers above referred to, and the presence of a gun-metal keel, weighing 1,050 lbs., and a centre board of the same material, weighing 770 lbs. The effect of these weights is to depress the centre of gravity so much that when the boat is capsized in the water it is impossible to maintain it in an inverted position. Special pains have been taken to produce great lateral rigidity, and the motor power is provided by a 20-h.p. standard gasoline engine of the 4-cylinder auto-marine type, which drives an 18-in. propeller at a speed of 400 revs. per min., and is located in the stern air-chamber, inside a water-tight door, which gives easy access to it. Should the boat be capsized the motor is instantly stopped by an ingenious arrangement of balanced metal rings, which in that situation cut off the ignition. The lifeboats, which are designed to proceed either under sail or motive power, or both together, are built for the Government by the Electric Launch Co., of Bayonne, New Jersey.

More Salvation by Motor.

General Booth, who has just celebrated his seventy-seventh birthday, has decided to undertake a third motor campaign, this time starting amid the Highlands of Scotland. He will leave Inverness in his "White" car on July 30th and finish at Plymouth on August 29th. Subsequently he proposes visiting Japan.

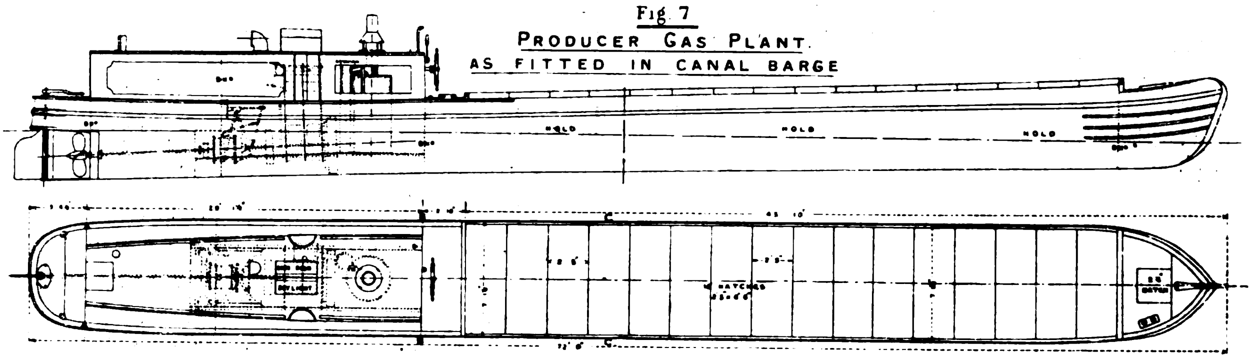
GAS ENGINES FOR SHIP PROPULSION.*

By J. E. Thornycroft.

(*Concluded from page* 466.)

Fig 7

Producer Gas Plant as fitted in Canal Barge

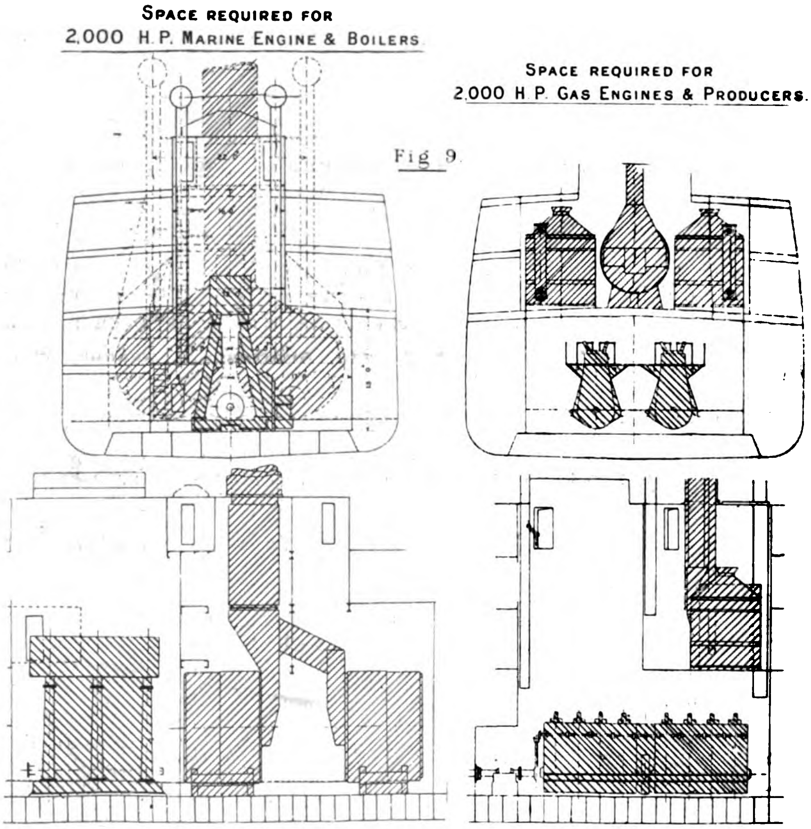


Marine Gas Engines.

The one great disadvantage of the internal combustion engine is the necessity of setting the engine in motion before it will run automatically. For powers less than 200 h.p., it is preferable to employ a reversing gear, keeping the engine always running in the same direction, or to use a reversing propeller. Compressed air is being employed for starting up large engines. For moderate powers, a single-acting engine with a trunk piston is found most convenient, as the piston does not require to be water-cooled, until one as much as about 2 ft. in diameter is employed. A single cylinder of 20 in. diameter and 2 ft. stroke, running at 120 revolutions per minute, will give about 100 h.p., taking the average working pressure at about 80, which is less than the figure often obtained. The same sized cylinder, working as a double-acting cylinder, would, of course, double the horse-power; but, besides the additional valves, which must be an exact duplicate of those required for a single-acting engine, there is the complication of the water-cooled piston and rod. This at first sight will appear somewhat serious to the marine engineer, but there does not seem any reason why they should not meet with success at sea as they have done on land.

For small plants of from 100 to 200 h.p., a small auxiliary internal combustion motor is found most convenient for blowing up the producer, for starting it, and also for starting the main engine. For larger powers fitted to vessels where steam capstans and steering gear are fitted, it is thought that the best plan will be to employ an auxiliary

Fig 9


Space required for 2,000 H. P. Marine Engine & Boilers

Space required for 2,000 H. P. Gas Engines & Producers.

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* Excerpts from a paper read before the Institution of Naval Architects, on April 5th, 1906.

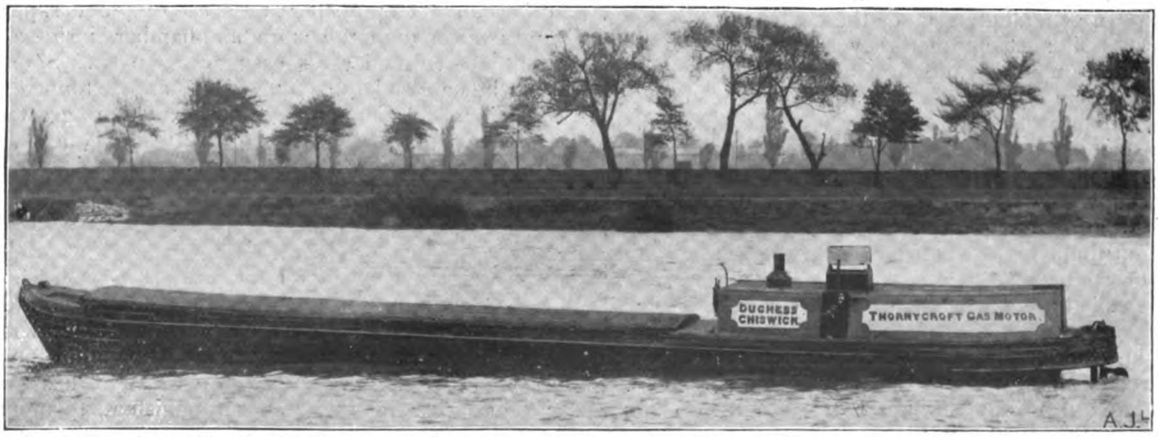


Fig. 11.—Suction gas barge, "Duchess," built by J. I. Thornycroft and Co. This is the craft which recently made a long tour by canal from London to Manchester and back.

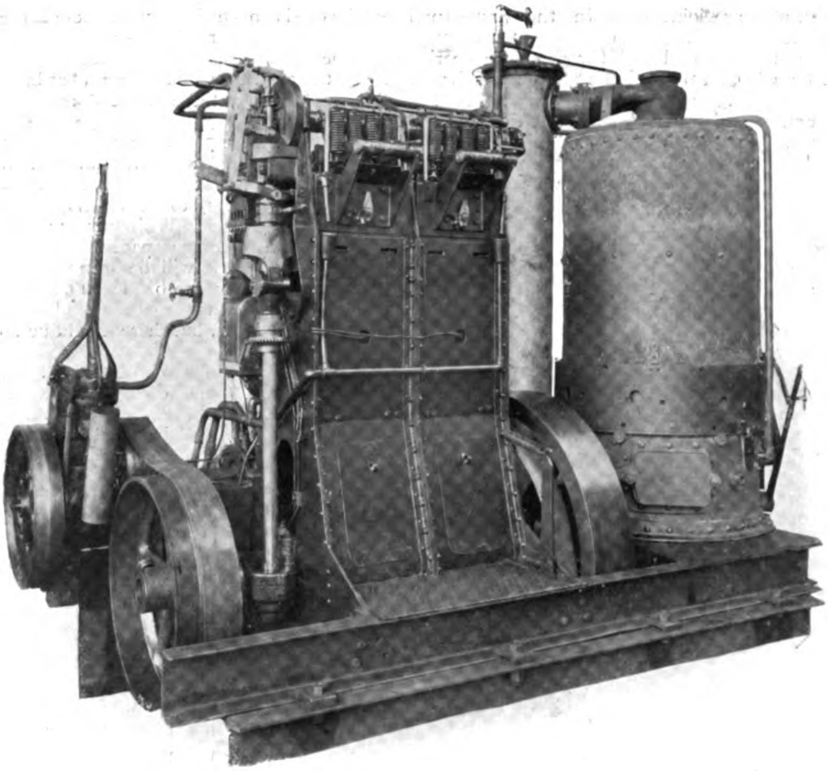


Fig. 12.—Two-Cylinder Suction Gas Engine. (This 35-h.p. plant was fitted in the Barge "Duchess.")

boiler, which can be heated by the gas when the whole plant is at work, and can be used independently to drive the various auxiliary and starting engines when the producer is not alight.

Relative Merits of Gas and Steam.

Professor Capper has stated that the theoretical maximum thermal efficiency of the steam engine is only 30 per cent., and only from 5 per cent. to 20 per cent. of the heat generated is ever turned into useful work. In the case of the gas engine, the theoretical efficiency is about 80 per cent., and in practice 25 per cent. to 30 per cent. of heat developed in the cylinder is turned into useful work.

For vessels fitted with small-powered compound condensing engines of less than 100 h.p., the fuel consumption will be from 2 to 3 lbs. per i.h.p. For gas plants of this power the fuel consumption will be less than 1 lb. per i.h.p. For larger powers of not less than 500 h.p. the economy will not be quite so marked, but will be about, say, 1·6 lb. per i.h.p. for steam, and ·8 lb. per i.h.p. for gas; in other words, the same coal will do double the work.

The stoking and the cleaning of the fire of the producer are much less than would be required for a steam boiler of the same power, the stoking being practically automatic, and practically the whole fuel other than the clinkers is consumed. From the plants made, and from designs that have been got out for moderate powers, it would appear that the space occupied by the gas generator and engine is about the same as the steam plant; but for large powers, where a double-acting gas engine is employed, the weight will be considerably less, as the engine will be about the same weight as the steam engine, and the producer will be very much lighter than the boiler.

Several tugs, boats, and other vessels have been fitted with similar engines, and are at the present time running on the Continent on the inland waterways, but, as far as is known, the "Emil Capitaine" was the first vessel fitted with a gas engine and producer to run in the open sea.

For the purpose of comparison, tests were made on November 8th, 1904, with the "Gastug No. 1" and "Elfriede," a steam tug of very nearly the same dimensions and power. The "Gastug No. 1" is 44 ft. 3 in. long by 10 ft. 6 in. beam, and is fitted with one of the 4-cylinder 70-h.p. suction gas plants. The "Elfriede" is 47 ft. long by 12 ft. beam, and is fitted with a triple-expansion steam engine developing 75 h.p. At the towing meter the "Gastug No. 1" attained a maximum pull of 2,140 lbs., and the "Elfriede" a maximum of 2,020 lbs. A run from Hamburg to Kiel and back was made by these two boats, during very stormy weather, at a maintained speed of 8½ knots. The consumption of fuel was measured for a period of 10 hours, and was as follows:—For the "Gastug No. 1," 530 lbs. German anthracite; for the "Elfriede," 1,820 lbs. steam coal. This shows an economy of 1 to 3·44 in favour of the gas plant.

Messrs. Deutz, the well-known gas engine builders of Cologne, have fitted one of the large Rhine barges with two of their 2-cylinder land type engines and producers. The vessel is of 200 tons carrying capacity, and is said to have given satisfactory results, running on the Rhine between Rotterdam and Cologne.

Canal Barge.

To determine the suitability of the Capitaine system for small powers, a canal barge (Figs. 7 and 11) has been fitted with a 2-cylinder 35-h.p. engine (Fig. 12), and it has been sent on an extended trip over the English canals. She left Brentford fully loaded, and towing two ordinary canal barges, which she took to Birmingham. After giving various demonstrations there, she proceeded to Manchester, and, after making further trials there, worked her way back to the Thames at Oxford, returning to Chiswick at the end of February. The total fuel consumed was 5 tons 1 cwt., the engine having been under way for 40 days.

The only difficulties experienced on the trip were due to the shallowness and the bad state of many of the canals. It would appear that the only sort of propeller suitable for canal work is one of the strongest description, made of steel, which can be relied upon to bring up the engine, if necessary, without damage to itself when striking large stones, or getting jammed up with old ropes. It is interesting to note that a considerable gain has been effected in cargo space by the substitution of the gas plant. In addition to the high economy which can be obtained with the gas plant for canal barge propulsion, there is the great advantage over the oil of absence of any smell. To demonstrate the possibility of using gas plants for large

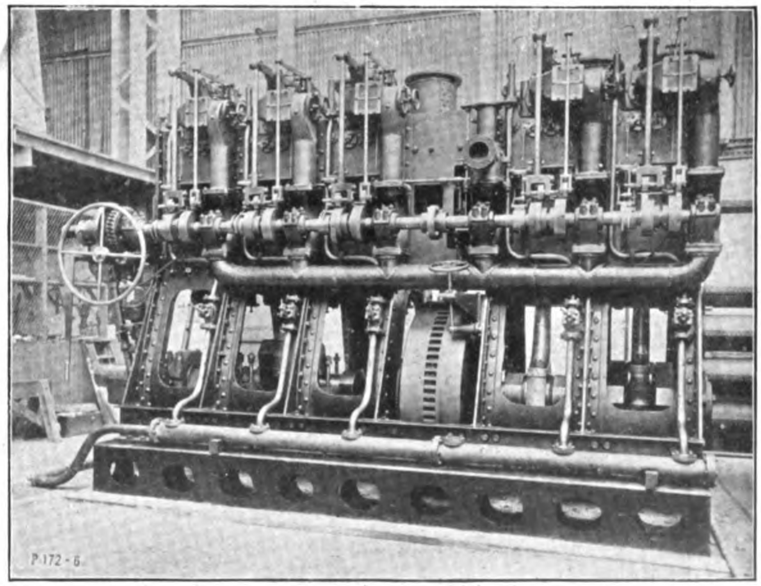


Fig. 13.—500-h.p. suction gas engine (Built by Messrs. William Beardmore and Co., who are joint owners with Messrs. J. I. Thornycroft and Co., of the British "Capitaine" patents).

powers, Messrs. William Beardmore and Company, who are joint owners with the author's firm of the British Capitaine Patents, are constructing sets of engines of 500 and 1,000 h.p., to run at a speed of about 130 revolutions per minute. The 500-h.p. set (Fig. 13) is generally of similar construction to the smaller sizes, the framing consisting entirely of steel plates arranged to transmit the stresses directly from the crank-shaft bearings to the cylinder-heads. Cam-shafts for operating the inlet and exhaust-valves are placed on either side of the cylinders, the valves being operated by rocking levers, so that, when the cylinder head is removed, free access can be obtained to withdraw the pistons. The 500-h.p. engine (Fig. 13) consists of five cylinders, each capable of developing 100 h.p. The reason for adopting this size of unit has been that the largest piston is being employed which it is thought safe to use without water-jacketing it. The 1000-h.p. engine has the same diameter and stroke of cylinder, but the engine is double-acting, and the pistons are necessarily water-cooled. These large engines are started by admitting compressed air or gas through special starting valves, and reversing is effected by an arrangement for shifting the cams for operating the valves to the right relative position for running the engine in the opposite direction. The engine being uncoupled from the propeller-shaft by means of hydraulic clutch or coupling for the short time while reversing is taking place.

The producers for these engines are arranged to work with bituminous fuel, the producer being stoked from the top, and the gas drawn off from the hottest zone of the producer. The green fuel on the top is pre-heated by the hot coal underneath, and the tarry products carried through the incandescent fuel. A special feature of the producer is the arrangement for preventing the caking of the fuel and the formation of cavities.

In the first experimental vessels to be fitted with these large engines, the usual "donkey" boiler will be retained for the purpose of working the steering and other auxiliary engines, and for working the compressors for starting up the engines, when the plant has been some time at rest. When under way, these boilers may be heated by the gas from the producer.

Fig. 9 shows the machinery space of the 7,000-ton cargo steamer recently constructed by Messrs. Beardmore and Co., Ltd., and an alternative arrangement which has been got out by Mr. W. W. May (Messrs. Beardmore and Co.'s engineer) to fit vessels of the same power with gas engines and producers. With this arrangement a saving of 13,000 cubic feet of cargo space is effected, besides a considerable gain in weight. It will be seen that the producers themselves are so small that they can be placed partially above the engines. It has been suggested that trouble would occur from the poisonous gases from the producer, but there should be no trouble from this cause.

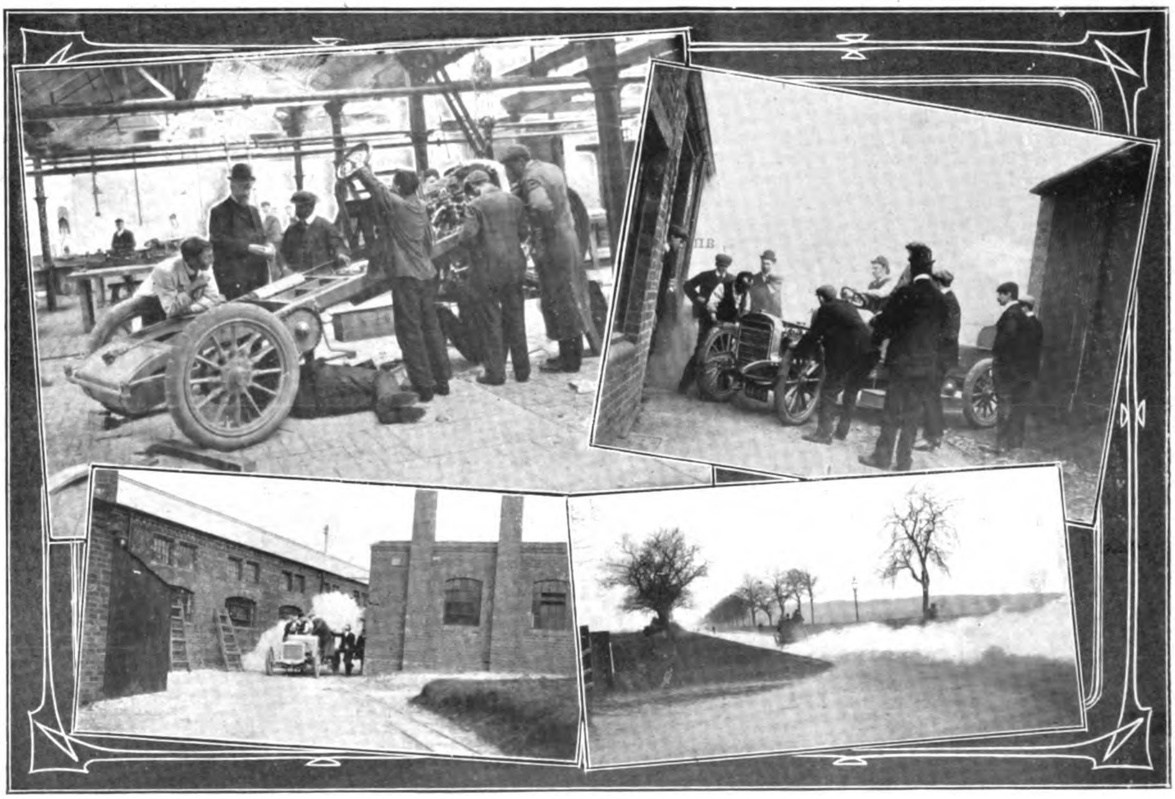
There are many stationary engines of 250 to 400 h.p. per cylinder running regularly every week from Monday morning to Saturday afternoon without a stop. The Premier Gas Engine Company give an instance of an engine which has made a run of fifty-one days without a stop, the previous run being forty-nine days without a stop of any kind.

From the various physical changes which take place within the cylinder of an internal combustion engine, it is evident that it cannot well compete with the steam engine as far as continuous running without cleaning and adjustments are concerned; but, from results that are being obtained in everyday use, it is submitted that the reliability is now so good there need be no hesitation in adopting them on this account.

* * * *

Returning from the Pre-Motor Age.

The effect which the introduction of the automobile has produced on almost every phase of modern life, receives a pathetic testimonial from the experiences of Mr. Jabez Balfour on his return to ordinary existence. The world as he knew it before his release was a world in which for all practical purposes the motor was not. When he leaves Parkhurst it is in an up-to-date motor vehicle, and as he ultimately found, possibly to his advantage, he was pursued and finally discovered by an enterprising pressman in an even more up-to-date automobile still. It is an incident of this kind that brings home with adequate force to us, who are sometimes likely to forget it, the enormous mechanical progress that has been made during the last eleven years.



Finishing touches. The car just out of the erecting shop.
Coming down "the alley," all aboard. Off at top speed to the Lickey Hills.

The "birth" of the first "Austin" Chassis.

THE SPEED OF MOTOR BOATS AND THEIR RATING FOR RACING PURPOSES.*

By Linton Hope.

(*Concluded from page* 464.)

In the autumn of 1902, Mr. E. H. Hamilton (editor of the *Yachtsman*), at the suggestion of Mr. A. F. Evans and myself, called a meeting of those interested in motor boats, which resulted in the formation of the Marine Motor Association. The whole of the winter of 1902–3 was occupied with constant meetings of the rule committee, among whom were several well-known yachting and motor experts, such as Captain du Boulay and Mr. Basil Joy, who devoted an enormous amount of time and attention to the subject. The chief difficulty lay in devising a suitable rating formula and scale of time allowances, to enable boats of various sizes and powers to race together on some sort of equality. This was rendered all the more difficult by the entire absence of any reliable data of the performances of these craft, there being very few of them in existence in this country at that time. It was generally agreed that a rating rule should tax all speed-producing elements, and put a premium on displacement. I, therefore, suggested the following formula :— $\frac{L \times P}{A}$ = Rating, which was finally accepted. In this formula, L = Length over all, P = Motor Power, or M.P. (an empirical equivalent to B.H.P.), and A = Immersed Sectional Area at the point of greatest beam. This rule was also adopted by the American Power Boat Association, a sister body formed in the United States a few weeks after the Marine Motor Association. With regard to the scale of time allowances, it was generally supposed that the time scale should be based on the assumption that the speed would vary as the fifth or sixth root of the rating, and, as the American Association produced a time scale based on the sixth root of the rating, it was decided to use it in this country for the season of 1903, and until further data were available.

The first year's racing under this rule and time scale did not show any great defects in either; but the racing in 1904 proved that either the rule or time scale must be radically wrong somewhere, as all the higher powered boats were winning by something like double the time they were allowing to the low powered boats. It was also evident that length was being taxed too heavily as compared with power. For example, a boat of, say 20 h.p., 40 ft. in length, and 2½ sq. ft. sectional area, was not nearly so fast as a boat of 40 h.p., 20 ft. in length, and the same sectional area, although under this rule they both rated the same.

It was not the intention of the Marine Motor Association to favour high-powered boats in this manner in their general racing; in fact, as the principal race of the year was for boats with unlimited power, it was thought advisable to alter the rule in such a manner that the extremely high-powered boats would be taxed heavily in comparison with those of moderate power and useful type, when racing together on time allowance. The alteration of the time scale was such a difficult matter with so little data that it was decided to alter the rule only, to suit the existing time scale as far as possible, basing the alteration on the results of the year's racing.

The following rating rule was adopted in 1905, and is now in use :—

$$\left(\frac{P^2}{A}\right) + \sqrt{L} = \text{Rating}.$$

It appears probable that the tax on length is rather too light, and that on power too heavy; it must, however, be borne in mind that it was essential to have a formula free from any complicated details, so that anyone with the slightest knowledge of figures could work out a boat's rating in a few minutes.

There is no doubt that the new formula is an improvement on the old one, many of the races having resulted in close finishes on time allowance; but, in spite of occasional good races, there were many others in which the time scale worked badly, and in all cases it appeared now to be unreasonably hard on the high-powered boats, although it worked fairly well with boats of moderate power.

As soon as the racing was over for 1905, I collected all the race reports and results of measured-mile trials of motor boats obtainable, and set out these performances on a scale of ratings, as shown in Fig. 4 (Plate III.). The upper portion of this diagram shows the various ratings from 500 to 10,000, and on the lower part ratings from 4 to 500 enlarged to a scale of 20 to 1. The speeds in knots are shown by the horizontal lines ranging from 4 to 30 knots, the black dot surrounded by a ring against a boat's name denotes that this performance is her best obtainable race record, while a heavy black ring denotes a measured-mile trial. The few results marked by two thin rings denote speeds in accordance with the owner's statement.

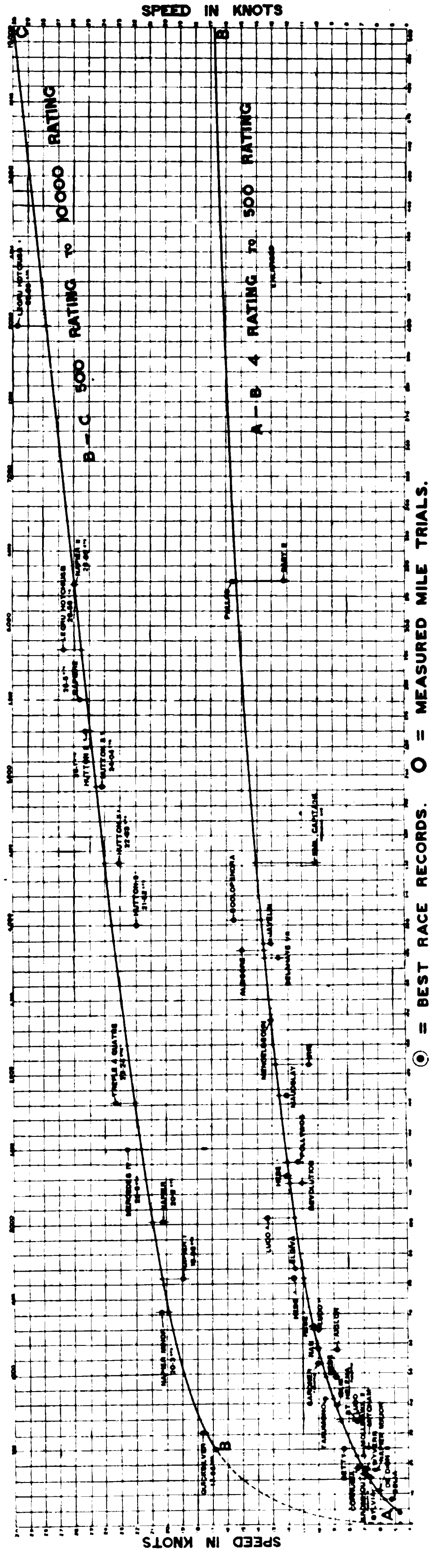


Fig. 4

MARINE MOTOR ASSOCIATION TIME SCALE. CURVE OF SPEEDS & RATINGS

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* Excerpts from a Paper read before the Institution of Naval Architects, April 5th, 1906.

The performances of forty-one boats of all sizes and descriptions are shown on this diagram, and I think it will be admitted that the curve of time allowance is based on a fair mean of the actual speeds, according to the ratings of the various boats, although this curve is necessarily only an empirical one.

The time allowance curve is theoretically the number of seconds which each boat will take to cover a sea mile, but this can only be correct in practice when she is running at a speed suitable to the formula. It would appear impossible to devise a formula which would take into account all the variations of a boat's speed for different powers, to say nothing of the effects of good or bad propeller and hull design. For this reason it is only possible to obtain a formula which will give a mean of each boat's speed for rating, and this, I think, the present rating rule does fairly well, although I am well aware that it leaves much to be desired.

The method of rating the power of the motor is also based on a mean of performances, and, although it slightly underrates the motors which use a high compression, it appears to answer its purpose in most cases.

The formula is as follows :—

$$\frac{A \times S \times R}{C} = \text{M.P., or motor power.}$$

A = total piston area of all cylinders in square inches.
S = stroke in feet.
R = maximum revolutions per minute ; and
C = 1,000 for 4-cycle, and 600 for 2-cycle motors.

These constants are based on the assumption (derived from a large number of examples) that for a 4-cycle motor the mean effective pressure in the cylinder is 66 lbs. to the square inch, and 55 lbs. in the 2-cycle motors under ordinary racing conditions.

The chief advantage which a rating rule of this sort possesses over an ordinary handicap is that, while a handicap does nothing whatever to encourage improvements in design of either boat, motor, or propeller, a rating rule at once puts a direct premium on the superiority of all or any one of the three. This is apparent, if we consider that a boat of any given rating is assumed by the rule to have a certain maximum speed; therefore, any improvement in this speed is all clear gain, as it is absolutely untaxed. A handicap, on the other hand, is based on the boat's actual performance, no matter how bad or good that may be. Consequently there is no encouragement in handicap racing to get a faster boat for a given size of hull and motor, as she would only be penalised for her increased speed.

The following list gives details of all the boats shown in Fig. 4, and I would point out that they include a 53-ton auxiliary yacht of large displacement, several 40-ft. racers, yachts' launches, and river launches. The engines include two and four-cycle motors, using petrol, paraffin, and suction gas, and ranging from 3 to 165 M.P. In justice to the suction gas motor, I must point out that the apparently poor performance of "Emil Capitaine" is due to the fact that the power rule does not rate her suction gas motor fairly, in assuming a mean effective pressure of 66 lbs., as in this case it is probably only about 30 lbs. Some paraffin motors do not show very well for the same reason ; but, as a boat fitted with a Gardner paraffin motor is one of the best performers among the low-powered boats, it is clear that paraffin motors need not have any lower mean effective pressure than petrol motors if well designed.

In conclusion, I must apologise for taking up so much valuable time with this paper ; but I trust that the subject will in future produce more interesting papers from abler hands than mine.

List of Boats with their M.M.A. Rating and Speeds.

Name.	L.O.A.	M.P.	Rating.	Best Recorded Speed.		Best Race Record.	
				Knots	Secs. per Mile	Knots	Secs. per Mile.
Zelia	34·00	5·00	7·24	5·20	692·0	—	—
De Dion II. ...	25·00	3·89	11·15	—	—	6·00	600·0
Sylvia	20·00	5·81	15·56	6·60	545·0	—	—
Kromhout	40·00	13·78	16·74	7·00	514·0	—	—
Napier Major ...	45·00	15·08	17·84	—	—	6·24	577·0
Wyvern	30·00	8·00	18·50	6·80	529·0	—	—
Cornubia	25·00	6·50	18·63	7·40	486·0	7·20	500·0
Mollihawk II. ...	73·00	30·00	22·56	7·00	514·0	—	—
Mitcham	22·50	10·30	25·15	—	—	6·75	533·0
Ludo (1) ...	25·33	7·83	34·00	7·40	486·0	—	—
St. Helena	35·00	15·15	34·75	—	—	7·54	477·0
Betty	30·00	7·81	25·17	8·30	434·0	—	—
Iblis...	25·00	10·13	39·09	—	—	8·72	413·0
Hebe (1)	30·00	11·64	48·89	8·78	410·0	—	—
Takumono	21·40	10·08	41·60	—	—	9·52	378·0
Gardner	32·50	15·12	53·30	10·00	360·0	—	—
L'Aiglon	42·00	24·0	57·90	8·70	413·5	—	—
Nan...	25·00	10·50	58·50	10·00	360·0	—	—
Ludo (2)	25·33	11·20	64·74	9·94	362·0	—	—
Hebe (2)	30·00	13·72	65·80	10·26	351·0	—	—
Hebe (3)	30·00	15·34	80·89	11·54	312·0	—	—
Elgiva	25·00	16·58	85·1	—	—	11·47	314·0
Ludo (3)	25·33	14·27	102·00	13·30	270·0	—	—
Revolution	30·00	20·11	113·61	—	—	11·00	325·0
Hebe (4)	30·00	18·56	116·00	12·00	300·0	11·58	311·0
Pollywog	30·00	22·56	120·58	11·25	320·0	—	—
Maudslay	30·00	23·91	143·00	12·00	300·0	—	—
Iris	30·00	22·66	153·30	10·50	343·0	10·00	360·0
Mendelssohn ...	21·30	13·66	168·30	—	—	13·00	276·0
Delahaye VII. ...	30·00	21·83	188·78	12·50	288·0	—	—
Albicore	40·00	26·10	191·43	—	—	14·90	242·0
Javelin	25·00	24·65	193·70	—	—	13·00	276·0
Scolopendra I. ..	30·00	20·34	215·50	15·40	234·0	15·20	236·0
Emil Capitaine ..	60·00	58·37	220·80	10·00	360·0	—	—
Pallas	28·00	29·02	314·92	—	—	15·45	233·5
Baby II.	30·00	35·64	315·29	—	—	12·05	299·0
Quicksilver	30·00	43·07	611·70	—	—	17·65	204·0
Napier Minor ..	35·00	73·00	1423·50	—	—	20·30	177·5
Napier I. (1903)	39·90	66·40	1641·00	—	—	18·88	190·5
Napier (1905) ..	39·40	73·00	2191·00	—	—	20·20	178·0
Mercedes IV. ...	39·40	100·00	2506·30	—	—	22·50	160·0
Trèfle à Quatre	32·80	75·00	2818·20	—	—	23·24	155·0
Hutton II. (1)	39·90	114·8	4000·00	21·82	165·0	—	—
Hutton II. (2) ...	39·90	120·6	4413·70	22·93	157·0	—	—
Legru-Hotchkiss (1)	39·40	137·7	5841·46	—	—	26·58	135·4
Hutton II. (3) ..	39·90	126·8	4922·00	24·04	150·0	—	—
Hutton II. (4) ...	39·90	132·1	5294·30	25·10	143·4	—	—
Rapière	26·20	110·0	5505·10	—	—	25·50	141·0
Napier II.	40·00	146·0	6276·30	25·84	139·0	23·75	151·5
Legru-Hotchkiss (2)	39·40	161·5	8032·00	29·68	121·3	—	—

* * * *

Query—a Time Saver?

So popular is the motor 'bus at the present moment that the number of people who waste more time waiting to catch one than they save by its speediness has become quite considerable. In fact, it is not at all unusual to see little crowds of people who will wait patiently for a quarter of an hour to get a seat in a motor 'bus, and the ingenuity they display in finding out the yards from which they start, and filling them up almost before they are on the road, is quite surprising. Perhaps the pleasure of being inside and witnessing the futile attempts of others to gain a footing on the vehicles has something to do with this—"suave mari magno," &c. In fact, to such an extent has the rage for saving time by motor 'bus extended that one persevering old lady was heard to declare, "I will wait for the motor if I wait all day. It saves such a lot of time, you know."

Motor Fire Engines in Berlin.

Berlin, it is stated, is following the example of several other German towns, notably Hanover, in adopting the motor fire engine municipally, or at any rate making experiments with a view to ascertaining the advantages and cost of upkeep. Among the reasons that have induced the Berlin Municipality to take this step, are to be reckoned the economy found to be characteristic of the maintenance of motor fire engines at Hanover, the upkeep per annum being only £100 for an automobile fire engine as compared with £600, the amount required to maintain a horse-drawn engine. An almost more important point, too, is that it has been clearly established that the automobile fire engine can leave the station quicker and arrive at its destination at a much greater speed than its horse-drawn competitor. At present, two automobile fire engines have been ordered, one to be propelled by electricity and one by steam.

RACES, RECORDS, AND TRIALS.

The A.C.G.B.I. 4,000 Miles' Tyre Trials, March 1st to 31st, 1906.

We learn that the awards of the judges in this trial are the Club's Gold Medal to the Collier Tyre Company, Limited, in Classes B, C, and D respectively. The car upon which the Collier tyres were tested in Class B, weighed over 26 cwt. complete, that in Class C over 32 cwt., and the car in Class D over 41 cwt. Actual speeds are not published, but we understand that the average mileage was not less than 20 miles per hour.

Scottish Reliability Trial—13th–16th June, 1906.

The following further cars have been entered for the above. We gave the first 25 entries on April 7th, and the rules appeared in The Automotor Journal of March 3rd. The order of entry is the order of start from Glasgow on June 13th. Entries close on May 2nd:—

26. F. Vernon Wentworth, 30-h.p. Coventry Daimler.
27. The Kennedy Motor Company, Ltd., 20–32-h.p. Darracq Phaeton.
28. The Kennedy Motor Company, Ltd., 10-h.p. Darracq Phaeton.
29. The Caledonian Motor Car and Cycle Company, Ltd., 18–24-h.p. Peugeot Phaeton.
30. Minerva Motors, Ltd., 22-h.p. Minerva.
31. Friswell, Ltd., 30–40-h.p. Peugeot.
32. Legros and Knowles, Ltd., 25–30-h.p. Iris.
33. T. C. Pullinger, 30–40-h.p. (6-cylinder) Beeston Humber.

A striking panel show card has just been issued by the Coventry Chain Company, Limited, a supply of which the company will be pleased to send to anyone in the trade.

Dewar Challenge Trophy.

Sir Thomas Dewar having offered the control of his challenge trophy to the Automobile Club, which previously has been used in competitions for "non-stop" record runs, the Club have decided to accept the trophy, which is to be awarded for the most meritorious performance in a long-distance trial taking place between January 1st and December 31st in any year.

Race for Steam Cars.

It has been decided by the Automobile Club that a race for steam cars shall take place this year, provided that six cars are entered of at least three different makes of touring type. The rules are to be based generally on the International Tourist Trophy regulations, with additional fuel allowance.

Coming Events.

New provisional dates announced for the coming season are: March 12th, South Harting Hill Climb; July 14th, "Henry Edmunds" Hill Climb.

Rochet-Schneider Cup.

June 4th has been fixed for this race, on the Auvergne Circuit.

Vanderbilt Cup Race.

The date fixed for this event is October 6th, entries closing on July 1st. The fee per car for the race has been fixed at £200. The rule under which it was imperative that cars should be constructed with a differential gear has been abolished.

A Pope-Toledo is the first car to be entered for the American team for this race.

Circuit Européen.

Entries mount up but slowly for this big Continental event, although it was expected an appreciable addition would be made to the list of competitors on Friday of this week, when entries at single fees closed. In the meantime, in addition to the 23 engagements already announced in The Automotor Journal, there are a further 8 to record, viz., 2 Beeston-Humbers, 1 Fiat, 1 Gobron-Brillie, 1 Cornilleau-Ste. Beuve, and 3 Peugeot-Lion, bringing the total to 31.

The important question of fuel supply, we are officially informed, has been satisfactorily dealt with in France by the A.C. de France. Arrangements have been made whereby, in exchange for coupons, petrol and lubricating oil can be procured at all points at one uniform price.

Targa Florio.

Time for entries to close, for manufacturers and private owners, was last week extended until Friday of this week for makers, and until a later date for amateurs. The race, it will be remembered, takes place on May 5th in Sicily.

Resilient Wheel Trial.—Paris—Nice—Paris.

Ten of the thirteen devices entered in this French trial started, on Wednesday last, upon the first stage, from Paris to Dijon (332 kiloms.). Particulars of this contest, which extends over a route of 2,200 kiloms., were published by us on February 10th. The list of entries appeared in The Automotor Journal of April 7th.

A British-built Daimler Car in America, *en route* **from New York to Boston. This was one of two Daimlers—a 35-h.p. and a 30-h.p.—which recently, in company with a C.G.V., effected a run from New York in connection with the Boston Automobile Show. During the trip, which was quite devoid of any incident so far as the mechanical running of the cars was concerned, the cars sank up to their hubs in mud upon an almost impassable piece of road between Bridgeport and New Haven. It was necessary there to place brush and fence rails so as to afford traction for the wheels. The 35-h.p. car had previously taken part in the races at Ormond Beach, where it won the 10-mile "Corinthian Cup" race.**

CLUBS AND ASSOCIATIONS.

North-Eastern Automobile Association.

THE town council of Richmond (Yorkshire) applied recently to the Local Government Board, through the county council of the North Riding of Yorkshire, for the closing to motor traffic of a portion of the road known as Quaker's Lane, in Richmond, this road being on the direct route from places on the east of the town to Swaledale, which lies to the west. As the result of representations made by a deputation from the North-Eastern Automobile Association, the town council have agreed to withdraw their application for the present, and are removing the existing direction notices which have tended to send the traffic through this particular road, and are placing the same or similar notices on a parallel road, which is much wider, and very slightly longer in distance. The Association desires to urge all motorists passing through Richmond to very carefully observe any direction notices they may see, and not to pass down this portion of road, which there is no necessity to do in view of the alternative route.

Society of Motor Manufacturers and Traders.

AT a meeting of the council of the society last week the plan for the Olympia November Exhibition was considered and approved. This plan shows increased gangway accommodation, and in several other respects is a decided improvement upon the previous method of laying out the Exhibition.

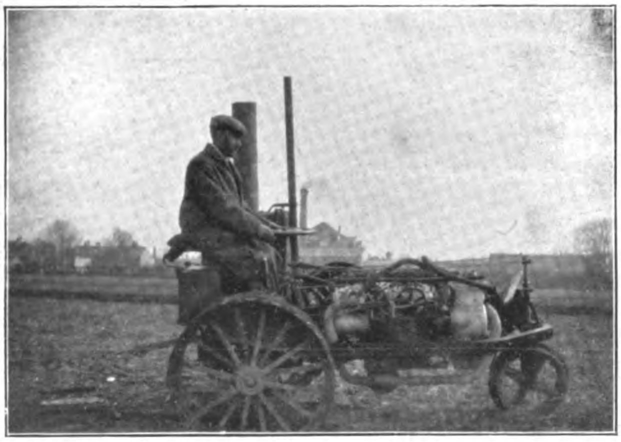
The marine section of the society has been active recently. The committee of that section has had under further consideration the proposed Motor Yacht Club's reliability trials, and it was also represented at the conference convened by the Board of Trade on the Thames Conservancy regulations, with reference to which regulations the society has for some time past been taking active part in connection with the Motor Yacht Club and the Marine Motor Association.

Yorkshire A.C.

A LECTURE was given at the club's headquarters, the Great Northern Hotel, Leeds, on April 11th, by Mr. Claude Johnson, "On Incidents amusing and serious in connection with the Earlier Days of Motorism." At the conclusion Mr. Claude Johnson was elected an hon. member of the club.

On April 28th the first club run of the season will take place to Harrogate, members meeting at the Hotel Majestic at 4 o'clock, where they will be entertained to afternoon tea by the chairman of the club (Mr. E. H. Hepper) and Mrs. Hepper.

The speed trials for this year will not be held on June 30th, as previously announced, on account of the date clashing with other important fixtures. A meeting has been called for April 25th, when the club and its branches will confer as to a suitable date and place. It is the intention of the club this year to hold a very large meeting.



Sir Horace Plunkett, the Minister of Agriculture for Ireland, has recently shown considerable interest in the practical application of the Ivel Motor to agriculture, and our photograph shows Sir Horace actually driving one of these machines at Biggleswade, where he visited the works of the company, and examined carefully the work which is done by the Ivel Motor.

MOTOR CYCLING.

Motor Cycling Records.

AT Canning Town track on Easter Monday, C. R. Collier on a 7-h.p. machine put up new English records from 1 to 27 miles, when his belt snapped. At 44 miles his connecting rod broke, and then mounting a new machine he covered 50½ miles in the hour, against his own previous record of 54 miles 523 yards made on July 12th, 1905. Collier's chief times were as follows:—

Miles.	m.	s.	Miles.	m.	s.
1	1	7⅖	20	21	23⅕
2	2	7⅗	30	34	43⅕
10	10	33	40	46	4⅗

The race was the main item in the Easter programme at Canning Town, and was a one-hour match against G. A. Barnes. The latter was hopelessly out of it on an 8-h.p. French machine. At 3¾ miles he punctured his front tyre, and a series of other mishaps left him with under 24 miles for the hour.

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PUBLICATIONS RECEIVED.

Modern Steam Road Wagons. By William Norris, A.M.I.C.E., M.I.M.E. London: Longmans, Green and Company. Price, 7*s.* 6*d.* net.

The Motor Year-Book and Automobilists' Annual, 1906. Edited by H. Massac Buist. London: Methuen and Company. Price, 7*s.* 6*d.* net.

Record of Sports, 1905. Liverpool: The Royal Insurance Company, 1, North John Street.

Catalogues.

Swift Gold Medal Motor Cars, 1906. The Swift Motor Company, Limited, Coventry.

❋ ❋ ❋ ❋

COMMERCIAL POINTS.

Armoured Tyres.

FOR some time past the Continental Tyre and Rubber Company's non-skid tyres have been familiar to all motorists. On the latest type the steel studs, which are embedded direct in the cover, have square heads, and are set close together, so that the tread is almost entirely covered by this flexible band of metal, and becomes practically puncture proof. Another important announcement is that the company have made the substantial reduction of about 25 per cent. on the former prices of these tyres, owing to their increased facilities for manufacture.

AT the recent motor exhibition at Vienna, the tyre statistics, we learn, showed that "Continentals" (including motor cycles) accounted for 321 wheels. The total number of wheels was 651, the remaining wheels being fitted with 17 other makes of tyres.

Catalogues and Price Lists Wanted.

GARAGE CONTINENTAL, LIMITED, motor car and motor cycle dealers, of 4, Loveday Street, Johannesburg, South Africa, write us that their entire premises took fire on March 13th, thereby entirely destroying their large stock of cars, motor cycles, spare parts, accessories, &c. The company would feel obliged, therefore, if manufacturers and agents in the motor line will forward to them their catalogues and price lists in duplicate.

Retreading Tyres.

WE have received the new list issued by the Acre Rubber Company, in respect of the tyre repair work in which they specialise. Motorists can obtain old covers renovated to almost any extent, provided that it is possible to repair them at all, but the company state that they can accept no responsibility for tyres which have previously been "doctored" elsewhere. Retreading costs from £1 1*s.* 6*d.* to £3 11*s.* 11*d.*, according to the size of tyre. At a slightly increased price the covers can be re-rubbered all over, while new linings involve an outlay of from 5*s.* 3*d.* to 14*s.* 7*d.* Repairs to inner tubes are, of course, also undertaken by the firm.

Switzerland More Favourable to Motors.

Permission has been given by the Swiss authorities for motor cars to cross the Simplon Pass.

Aftermath of the Motor Road Bill.

The London to Brighton Motor Road Bill which didn't come off, has now arrived at the stage in which some of the proceedings in connection with it, which were carried out *below* the surface are beginning to appear *above* the surface. A Brighton gentleman, Mr. A. N. Eyre, was last week sued for £500 due on a bill of exchange to a Parliamentary agent in connection with the promotion of the Bill. "This was not a wild cat scheme," said counsel for the plaintiff. Dear me, whoever said it was! A similar suit was also brought against Mr. Samuel Barber, of East Hanningfield.

Misleading Statistics.

The Home Secretary was recently asked in Parliament for an exact return of the number of accidents to persons and property in the Metropolis during the first three months of the present year. It is almost superfluous to add that the framer of the question was one of the little band of virulent anti-automobilists—to wit, Mr. Galloway Weir. The figures supplied by Mr. Gladstone were as follows :—

	Motor Omnibuses.	Motor Cars and Motor Cycles.
January	211	301
February	235	263
March	331	385
Total	777	949

But one must admit that figures arranged in this sort of way are not at all instructive. What is needed is the number of accidents, say, per hundred automobiles as compared with the number caused per one hundred by horse-drawn vehicles.

Driving and Mechanical Proficiency Certificates.

The next examination by the A.C.G.B.I. for London candidates for driving and mechanical proficiency certificates, will be at 119, Piccadilly, London, W., on Wednesday, April 25th. Full particulars of these examinations will be forwarded to candidates on application to the secretary, 119, Piccadilly, and entries should be received at least four days before the 25th.

Why Should They Rush In?

We referred some time ago to the fact that the Cyclists' Touring Club intended widening its organisation so as to admit motorist members. It was never quite clear that there would be any great inducement for motorists, who have the Motor Union and the Automobile Club, to become C.T.C.'s, so that it is rather entertaining to learn that a powerful amount of opposition is still being organised in the C.T. Club itself, against their admission. Motorists, we fancy, will take this opposition with supreme equanimity, as we fancy it was mainly to increase its financial resources that the proposal to admit motorists was first suggested. If the majority of the club refuse to have them, few motorists, we fancy, will be very much chagrined at the rebuff.

Five Years After.

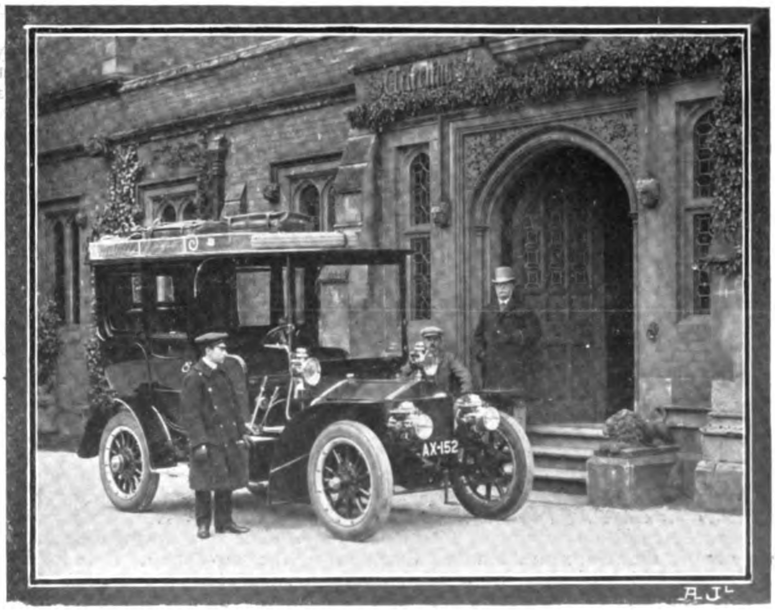
Sir Oswald Mosley, to whose interest in motoring we drew attention last week, has now, we learn, ordered a 6-cylinder Rolls-Royce, Mr. Rolls having, in 1900, given him his first ride on a motor car.

Dogberry Once More.

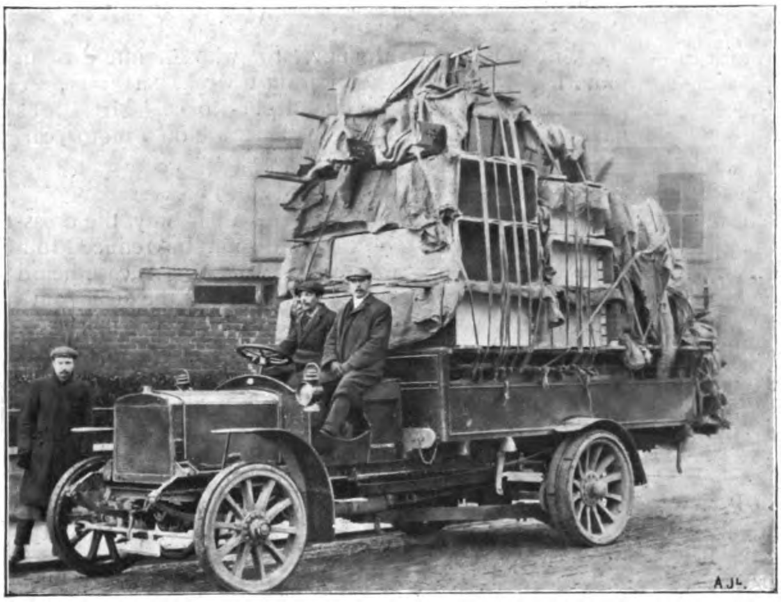
If the Kingston Bench had their way, the cross-examination of constables would soon be reduced to a farce or prohibited altogether. In a recent case heard before them a police constable swore that the defendant's car had no cover or glass front to it. As a matter of fact, his car, we understand, was provided with both, and to bring this point out his solicitor produced a photograph of it, and cross-questioned the constable thereon. The magistrates maintained that it was very improper to attempt to "confuse the constable" by producing such a photograph, and were unanimous that it ought not to have been brought into the case. One more piece of evidence, if any were required, that the object of magistrates is but too frequently not to elicit the truth but merely to be provided with an excuse for convicting.

A Bench of a Different Disposition.

The Newport county magistrates, who appear to form an honourable exception, are of quite a different way of thinking. Some of the magistrates distinctly said that they had no sympathy with the police tactics adopted in these motor car prosecutions, and another magistrate objected to the police stop watches as not being suited for the work to which they were put. This has made Alderman S. N. Jones, of Newport, very angry, and he said at a recent meeting of the Monmouthshire Standing Joint Committee that he was astonished at magistrates "saying such things." Alderman Jones evidently thinks that a defendant before a bench of magistrates should never be given a chance, and that all the bench exists for is to register decisions in the sense that the police would like.



The Rt. Hon. Lord Llangattock and his new 20-h.p. Rolls-Royce car, of which he recently took delivery and straightway drove down from London to his seat in Monmouthshire, doing the distance in 6½ hours, including an hour's stop for lunch at Cheltenham.



One of the latest petrol lurries built by Messrs. J. I. Thornycroft and Co. is that shown in the above illustration, this being a 24-h.p. type of vehicle in which the rear wheels are driven by spur-pinions meshing with internally-toothed rings, instead of by side chains. Three forward speeds are provided, and the vehicle is so geared as to run at about 12 miles per hour under normal working conditions. Two interchangeable platforms have been supplied with it to its present owners—Messrs. Harris, Lebus, and Co.—and thus time can be saved by lowering an already loaded body into place on the chassis. Several journeys a day are, we learn, made between London and the Kingston district.

Motor Postal Services.

AN extensive system of motor vans for parcel post delivery is shortly to be instituted in the West Riding of Yorkshire. Leeds will be the centre, and the routes will be on the roads to Huddersfield, Bradford, Harrogate, Wakefield, and Pontefract. The first van of the kind was started running a week ago between Leeds and York. The new vehicles are being ordered from a British firm.

Brighton Race Meeting Litigation.

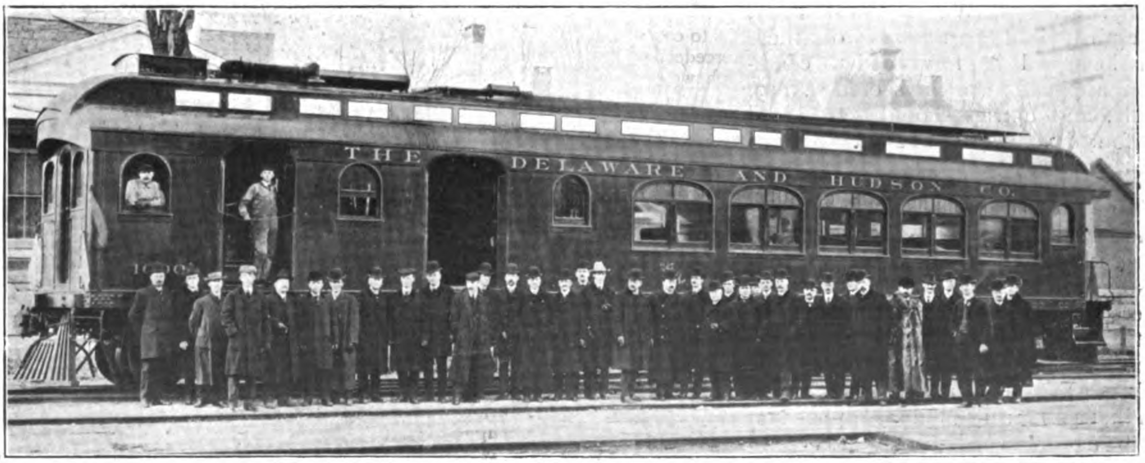
THE action which is being brought by a resident at Brighton, Mr. Shoesmith, to determine whether the Brighton Corporation were within their rights in tarmacing the Madeira Walk for the Brighton Race Meeting and defraying the cost out of the rates, is set down for trial, and is expected to come on for hearing some time after the Easter recess.

Hyde Park Motor Permits.

SOME months ago it was announced in THE AUTOMOTOR JOURNAL that special arrangements were to be made in 1906 to allow electric vehicles, as against other motor vehicles, to use Hyde Park during the "prohibited hours." It is now officially announced that licences and badges will be issued by the Commissioners of His Majesty's Works and Public Buildings for the admission of electric carriages to Hyde Park between the hours of 4 p.m. and 7 p.m. in the months of May, June, and July. Forms of application may be obtained, by letter only, from the Secretary, H.M. Office of Works, Storey's Gate, Westminster, S.W.

Another Tram Record.

THE electric tramway under Aldwych, which has now been running for a little time, was the scene recently of another object lesson in the effective manner in which a whole service can be blocked by a trifling accident. A car fouled a point in one case, and in another place there was a temporary failure of the electric current. The result was that all along the line, stretching up past Holborn Town Hall, passers-by were treated to the now familiar spectacle of a long row of perfectly motionless tramcars. The general traffic of the road was so dislocated that a special force of police had to be brought from Grays Inn Road Station to keep it "on the move.'



AN AMERICAN RAILWAY COACH WITH AN ENGLISH ENGINE.—**Independently driven railway coaches are everywhere obtaining great popularity. Our photograph illustrates one which has recently commenced service on the Delaware and Hudson Company's line in U.S.A. It is a 65-ft. coach and weighs 65 tons with its equipment, which consists of a six-cylinder Wolseley engine coupled direct to one of the General Electric Company's generators. At 450 revs. per min. 160 b.h.p. is developed in the petrol engine, which has 9-in. diameter cylinders with a 10-in. stroke. Current is normally provided by the generator at 600 volts, and the motors transmit their power to the driving wheels through spur gearing. The cylinders of the engine lie horizontally and are opposed. When starting up, black powder cartridges are inserted in the heads by a breech mechanism and fired by a hand trigger.**

COMPANY DOINGS.

Provincial Motor 'Bus and Traction Co., Ltd.

AT the statutory meeting of the shareholders of this company, Mr. A. A. C. Swinton, chairman of the company, presided. He mentioned that, in accordance with the provision in the prospectus, two additional directors had been nominated and appointed to the board, viz., the Right Hon. Lord Armstrong (who is a director of the North Eastern Railway Company), and Mr. Alfred du Cros (chairman of the Swift Cycle Co., Limited), two nominations which he thought were likely to strengthen the company's commercial forces.

Immediately following the statutory meeting, an extraordinary general meeting took place, the object being to obtain authorisation to establish a motor 'bus service as a commencement in London instead of the provinces, as originally intended. This followed upon a suggestion that they should commence operations in London in conjunction with one of the allied motor 'bus companies, and secure the whole of the output of a motor 'bus chassis of Sir W. G. Armstrong, Whitworth and Co., Limited, for the next eighteen months, Messrs. Armstrong having arranged to set apart a distinct portion of their colossal works at Elswick for the manufacture of these chassis. The working arrangement in London proposed was with the London and District Motor 'Bus Company, Limited, the owners of the "Arrow" 'buses. This offer was very tempting, and they therefore were desirous of accepting it. Under it, the organisation expenses would be kept at a minimum, and the management expenses would not exceed one-half of what they would otherwise have to pay if they were running alone. They would take all receipts of their own 'buses, and simply share expenses; while a joint management committee, drawn from the boards of the two companies, would look after the details of the joint management. They did not propose to abandon their intentions for the provinces, and had already been asked to consider certain propositions for running, or rendering financial assistance in the running, of 'buses in several districts. They proposed, however, to give their first attention to London. By joining with the "Arrow" company they also became partners, so to speak, in the alliance with the "Vanguard" company, whereby the greater part of competition would be eliminated. Under the circumstances it was advisable that they should later add the name of "London" to their title.

The resolutions to carry out the arrangements detailed by the chairman were unanimously approved, and it was stated that the company were promised a first delivery of chassis in about four months.

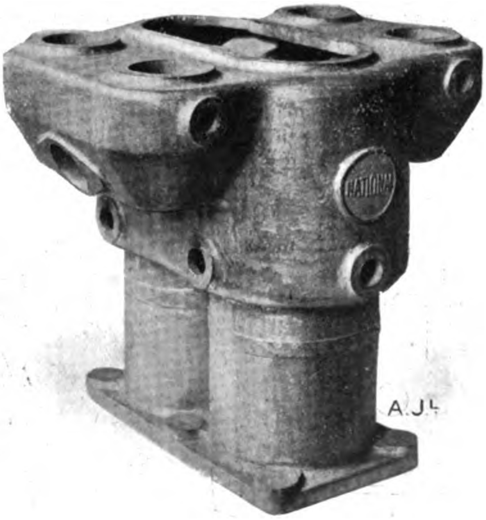
Motor Traction Company (1905), Limited.

AS foreshadowed in the circular issued by this company, which was published in THE AUTOMOTOR JOURNAL for April 7th, some very important announcements were made, likely to have far reaching effects upon the present motor 'bus industry, at the extraordinary general meeting of the shareholders, which was held last week under that notice, when Mr. F. H. Bromwich, the chairman, presided.

The chairman pointed out that the meeting was to confirm an agreement, dated March 31st, 1906, between the Mercedes-Daimler Company, Mr. S. F. Edge and their company, which would compromise various disputes which had for some time existed. The meeting was also called to increase the company's capital from £60,000 to £120,000, for the purpose of enabling the directors to carry into effect the agreement in question. Mr. Bromwich then proceeded to trace briefly the history of the Motor Traction Company. He said that the original company, of which the present was the immediate successor, was formed in 1897. Shortly before the formation of that company, an experimental service of motor 'buses had been inaugurated by the promoters of that company between Shepherd's Bush and Marble Arch. This he believed was the commencement of motor traction omnibus service in this country, and they might very well claim therefore to be the pioneers. The 'buses which were used for these experiments were built by the German Daimler firm at Cannstatt. Following these experiments, the original company was formed, and £120,000 of public money subscribed. An exclusive licence for London and twenty miles round, as well as a general licence in the United Kingdom for the manufacture and running of motor omnibuses made under the Daimler system, with the right to any improvements, from time to time, was granted to the company, for which £50,000 cash was paid through the British Motor Company, who had purchased from the German Daimler Company the British patents. The Company then set to work, in conjunction with the Cannstatt firm, with the result that the German Daimler Company supplied two further motor omnibuses with certain improvements, which had been suggested by experience. In 1898 and 1899 these two 'buses duly made their appearance on the streets of London, and ran for a considerable period, but it was obvious that they were still in an experimental stage, and would have to be further improved. In conjunction with the German company, other improvements were thought out, and as a result two further 'buses were constructed, and sent over to England, and, in addition, two 'buses were made at the company's own works in London. Two of these four 'buses ran, he believed, for upwards of 30,000 miles. During these experiments and the perfecting of the 'bus, unfortunately the company's capital had become practically exhausted, bringing the date up to 1902.

In the original licence it was expressly covenanted by the licensors, the British Motor Company, that they would not use or grant licences to use, establish, or assist in establishing, in opposition to the British Company within a radius of twenty miles of the General Post Office, any 'buses made under the Daimler patents. Notwithstanding this, the chairman stated that on October 18th, 1902, the British Motor Company purported to grant back to the German Daimler Company a licence to use these patents in direct competition with the British Company. He would not give any opinion upon this procedure, because an action was now pending to set aside this arrangement as regards the British Company, and the court would have to decide the rights of the parties.

Coming to a more recent date, viz., December 4th last, a resolution to liquidate the old company was passed by the shareholders, the benefit of the licence in question having been transferred to the present company, and the interest of the company became vested therefore in the directors of the new company, his (the chairman) association dating from that time. They at once carefully went into all documents, and found that the company was entitled only to a licence for all improvements on the original patents without charge, but in regard to any new inventions as distinguished from improvements, they were only entitled to these on payment of such price as might be mutually agreed or fixed by arbitration. The distinction between these two points was of course a very difficult problem, and, failing to arrive at a satisfactory understanding with the owners of the British patents, they had to commence proceedings in order to determine their rights. In the meantime, however, they took every opportunity of friendly negotiations, and, as a result of many conferences, the present agreement of March 31st, which the meeting was called to confirm, had been arrived at. The British Motor Company, the original licensors, having ceased to exist, the patents owned by them had been acquired by the Mercedes-Daimler Company and Mr. S. F. Edge, and he was glad to say that, in the present agreement, in connection with any new inventions, they would not only have their licence brought up to date, but would



Three castings, similar to that seen in our illustration, form the Cylinders on the new 40-h.p. 6-cylinder Engine that is being turned out by the builders of the "National" petrol cars. Not only will the special shape of the symmetrically-placed valve-chambers be noticed, but it will also be seen that a large opening is left in the top of the water-jacket for facilitating cleaning. This powerful 6-cylinder car—like the well-known 3-cylinder model, of which we have given fully illustrated descriptions on more than one occasion—is of the live-axle type, and its cylinders have a bore and a stroke of 5 inches.

have a right for all future time, without any further payment, to a licence under all improvements or new inventions relative to the patents which may become the property of either the Mercedes-Daimler Company or Mr. Edge. This licence applied not only to the Daimler patents, but to the De Dion-Bouton patents, and he wished particularly to impress upon the shareholders the importance which the directors attached to these additional rights. They had also secured Mr. Edge as a powerful friend, and he had his promise to work heart and soul with the board, and to give them every assistance for the future. Neither Mr. Edge nor the Mercedes-Daimler Company were getting anything for the valuable rights conceded, except shares in the present company, and they might rely that Mr. Edge would do everything he could to make those shares of intrinsic value.

In regard to the future, the chairman stated that they had been approached by several leading British firms asking for rights to build 'buses under their licence. One firm suggested that they should pay a royalty of £1 per horse power, and ¼d. per mile, where the omnibuses were maintained within twenty miles of the General Post Office. This would, it was calculated, result in a minimum royalty of £20,000 per annum, once the business was built up. They were not jumping at the first offer, but were making careful enquiries. What made their rights so valuable was the possession of the right to the construction in this country of the Daimler and De Dion-Bouton 'buses. They were not only entitled to the patent rights, but to the working drawings and models according to which the 'buses were made; so that, without any experimental work, they were in the position of being able to go forward upon the very latest lines.

The chairman, in conclusion, mentioned the action pending between the German Company and their own, in which they sought to set aside, so far as their company was concerned, the licence of October 18th, 1902, given to the German Company, and to thereby exclude the German Company from competition with them in London They claimed an injunction to restrain the German Company, and its agents, from using their alleged licence, and they would claim an account of all profits and royalties received by them in addition to damages. He could hardly speak too strongly of the importance of this action to the company. In the event of their claim being successful, they would then once more have the position which their company occupied, and was intended to occupy at its inception—the sole and exclusive right in London for the Daimler 'buses. Every 'bus which the German Company and their agents had sold in London—and, as they knew, they were many—would have been sold in breach of their rights, and the owners of them, whoever they might be, would have to come to them, both for the present and the future, if they wanted to continue running those 'buses. It would, of course, be their business to grant them such privilege; but they would do it upon their own terms, and so procure for themselves that large and profitable income, to earn which was the basis of the foundation of the company.

The agreements were subsequently unanimously approved, as well as the increase of the capital to £120,000.

NEW COMPANIES REGISTERED.

Gearless Motor Omnibus Company (Limited).—Capital, £10 in £1 shares.

Mercedes-Daimler Omnibus, London Syndicate (Limited), 1, Broad Street Place, E.C. Capital, £1,000 in £1 shares.

New Leader Cars (Limited), Aspley Motor Works, near Nottingham.—Capital, £75,000 in £1 shares. Object, to acquire the business carried on by the New Leader Motors, Limited, at Nottingham. First directors, F. Goodenough, A. R. Grimsdale, D. H. Grimsdale and T. B. Watkinson.

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BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

7948. 14th April, 1905. Improvements in Valve Gear for Internal Combustion Engines. William J. Crossley, of Messrs. Crossley Brothers, Limited, Openshaw, Manchester, and Arthur V. Coster, of The Limes, Derby Road, Heaton Chapel, Manchester. This invention is for the construction of valve gear for internal combustion engines, with a view to their being more simply constructed and operated. This gear is shown adapted to a vertical engine of the Otto or 4-stroke type, having the crank-shaft at the bottom and a single-acting cylinder at the top in the usual manner. The gear is stated to be applicable to all types of engines on the 4-stroke cycle. There are four figures. Fig. 1 is a vertical section of a cylinder fitted with this valve gear. On a countershaft, A, driven at half the speed of the crank-shaft, is placed one eccentric, B. The rod, G, of this eccentric, B, is coupled to a lever, D, which operates the exhaust valve, C, preferably by means of differential levers, E and F, which give a slow, powerful motion to the valve when commencing to open, and an increasing motion as it opens in the well-known manner. Attached to the eccentric rod, G, there is a second rod, H, and the continuous movement of the eccentric, B, by means of suitable connections, opens the admission valve, I, at the proper time. The opening and closing of the exhaust valve, C, are performed by the eccentric, B, during some 100 degs. of its revolution. The eccentric, B, moving in the direction of the arrow, has allowed the exhaust valve, C, to close, and has opened the admission valve, I. The admisison valve, I, should commence to open at, or a little before, the time the exhaust valve, C, closes, and, consequently, the opening and closing of the admission valve, I, cannot be performed by direct connection to the same eccentric, B, which operates the exhaust valve, C. The one eccentric, F, can be used for opening and closing the exhaust valve, C, and for opening the admission valve, I, if some other means are provided for closing it. The means are provided by interposing parts which either allow the admission valve, I, to trip or to be so disconnected from the eccentric, B, as to allow it to close independently by means of a spring, L, a dash-pot, M, being arranged to cause it to close without heavy shock. A suitable connection between the eccentric, B, and the admission valve, I, or the lever, J, which operates it, is a toggle joint, KK. This toggle joint, KK, is so arranged that it is pulled into the straight by the eccentric, B, at the end of its stroke whilst operating the exhaust valve, C. As the eccentric, B, moves round, it commences to move the gear so as to open the admission valve, I, at the proper time, the toggle links, KK, being in line with each other (or a very little past being in line), so as to take the endwise stress required to open the valve, I. The valve, I, goes on opening so long as the toggle-links KK, remain in line; but at the proper time these links are pushed out of being in line, so that they will no longer transmit the movement of the eccentric, B, to the valve, I, and the spring, L, on the valve, I, immediately causes it to commence to close. The dash-pot, M, causes it to close without shock. The eccentric, B, continues to revolve during the compression and working strokes without affecting either of the valves until it commences again to open the exhaust valve, C, then to straighten the toggle-links, KK, and subsequently to re-open the admission valve, I.—March 28th, 1906.

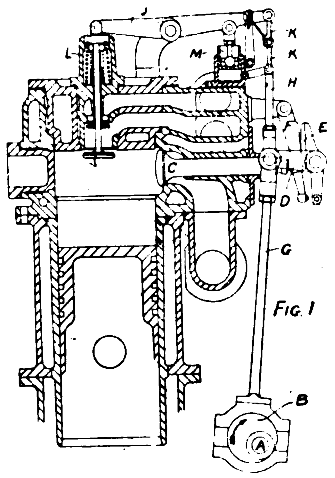
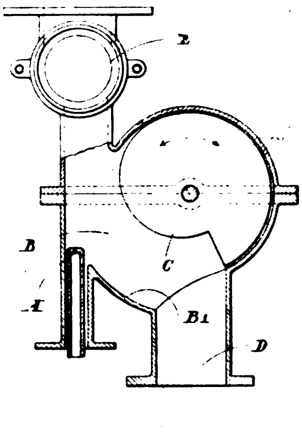


FIG. 1

15256. 25th July, 1905. Improvements in Carburettors for Internal Combustion Engines. Percy W. Noble, 19, Hertford Street, Coventry. This invention relates to carburettors for internal combustion engines, and has for its object to provide a simple form of carburettor in which the proportion of air to fuel is maintained as desired under varying conditions. The jet-nozzle is placed at one side of the spray-chamber, which may be rectangular. Opposite to the jet is a cam actuated automatically in accordance with the pressure in the spray-chamber by its being connected to a piston or diaphragm in a suction chamber. There is one drawing, a vertical section. The jet, A. is formed in one wall, B^1, of the spray-chamber, B, the cross-section of the spray-chamber being rectangular. In the spray-chamber, and directly opposite to the jet, is journalled a rotating cam, C. The profile of this cam is determined by experiment and the cam is adapted to be rotated so as to block up more or less of the passage through the spray-chamber, B, adjacent to the jet, A. This cam may be operated by hand, or is connected to a piston in a suction-chamber in communication with the spray-chamber above the jet in the well-known manner. Variation in the pressure in the spray-chamber is communicated to the suction-chamber, which alters the position of the piston, and consequently rotates the cam to enlarge or decrease the area of the passage, B, past the jet. The consequence of this is to vary the suction on the jet, due to the air entering at D, and to obtain the desired proportion of air to fuel, as is usual. The drawing shows the cam rotated to give a large passage past the jet, as for high engine speeds. By rotating the cam in the direction of the arrow the passage is decreased, and *vice versa*. At E is arranged a throttle-valve of any suitable type.—March 28th, 1906.



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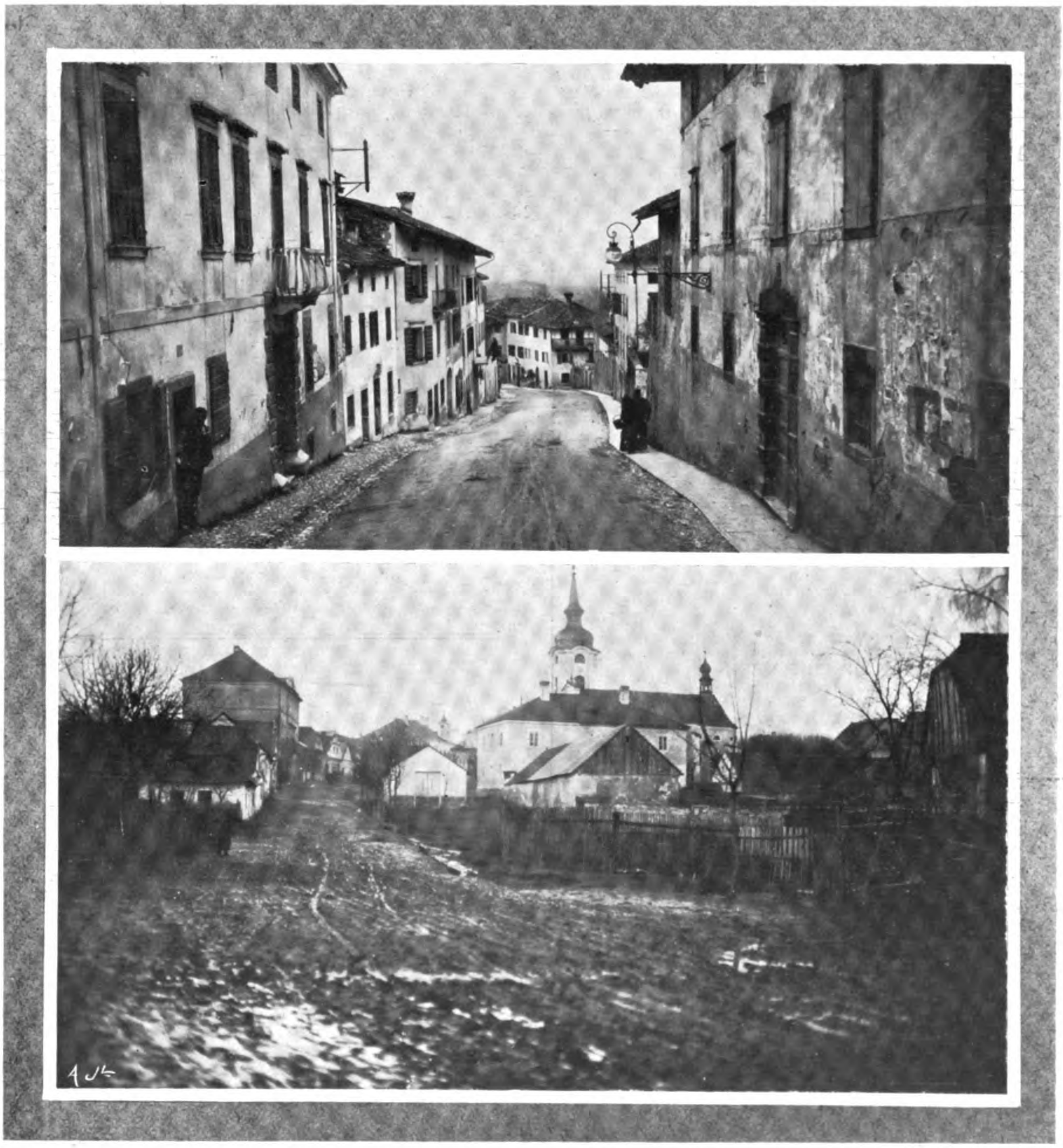

THE CIRCUIT EUROPÉEN.—Inspecting the Course. Our top picture shows a street in the village of Leoben, in Styria, and the lower photograph a scene on the route through Stirkovitz in Hungary.

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DIARY OF FORTHCOMING EVENTS.

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British Events.

April 28	Open Hill Climb (Essex M.C.).
April 28	Hill Climb (Mid Stafford A.C.).
May 5	Cars and Tricar Trial (Southern M.C.).
May 5	Hill Climb and Brake Test (Essex A.C.).
May 5	Welbeck Car Trials and Wilson Cup Race (Notts. A.C.).
May 5	British Motor Boat Opening Meet.
May 12	South Harting Hill Climb.
May 24	Frome's Hill Climb (Herefordshire A.C.).
May 26	Motor Union Meeting (Birmingham).
June 11–16	Land's End to John O'Groat's (Auto Cycle Club).
June 13–16	Scottish Reliability Trial.
June 30	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July	Motor Yacht Club Reliability Trials.
July 14	"Henry Edmunds" Hill Climb.
July 21	Motor Union Meeting (Bath).
Aug.	*Van Trials.
Aug. 6–18	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Sept. 22	Motor Union Meeting (York).
Sept. 27	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

April–May	Milan Exhibition.
May 1–15	Paris Voiturettes Trial (*L'Auto*).
May 6	"Targa" Florio (Sicily).
May 12–24	Tour de France (Motor Cycles and Voiturettes).
May 14–31	Milan Reliability Trial.
May 27	Motor Bicycle Championship (Moto Club de France).
June 4	Rochet-Schneider Cup (Auvergne Circuit).
June 6–13	Herkomer Cup.
June 17	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26–27	Grand Prix (A.C. de F.).
June 28–29	Kiel Motor Boat Races.
July 8	Motor Bicycle International Cup Race (Austria).
July 14–17	Ostende Meeting.
July 15	Mont Cenis Climb (Turin A.C.).
July 26–Aug. 15	Circuit Européen.
Aug. 13	Ardennes Circuit.
Aug. 18	Coupe de Liedekerke (Belgium A.C.).
Aug. 26–Sept. 2	Brescia Week (Italian A.C.).
Sept. 10	Florio Cup Race (Italy).
Sept. 15–16	Mont Ventoux Hill-Climb.
Sept. 20	Lake Major Motor Boat Races.
Oct. 5–14	Leipzig Exhibition.
Oct. 6	Vanderbilt Cup Race.

* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

What Fares should Motor Cabs Charge?

The motor cab has not come into our midst with quite the same rush as has distinguished the advent of the motor 'bus, but its numbers, if somewhat slowly, are surely increasing, and before long the horse will be displaced from the cab as completely, in all probability, as from the 'bus. This prospect calls attention to the revision that is required in the fares legally chargeable by carriages plying for hire if they are to be made properly to suit the automobiles. There are features existing in the regulations applying to the fares chargeable by Hackney carriages which are likely to give rise to curious results if applied to motor cabs. A two-wheeled vehicle is entitled to a charge of *2s. 6d.* per hour if hired by time. A four-wheeled vehicle is only entitled to *2s.* At the same time, the four-wheeled cab when hired by time cannot be compelled to proceed at a greater pace than four miles an hour, a speed selected presumably in 1869, when the Metropolitan Cab Act was passed, as a "moderate speed" for the familiar growler. What would happen if some of those irritating persons who make a speciality of getting up the law insist on hiring a motor cab for an hour at a cost of *2s.*? The cabby would presumably be within his rights if he proceeded at four miles an hour, but the sight of motor cabs hired by the hour and proceeding through the streets of the Metropolis at this funereal pace would be likely to excite hilarity. If, however, the four-wheeled vehicle is provided with two horses, it is entitled to charge *2s. 6d.* instead of *2s.* per hour. As motor cabs will generally be driven by 10-h.p. engines, at least, there is good ground for asking that their remuneration per hour should be proportionately increased, but of course this at present would be quite illegal. This question of fares is, of course, quite outside the suggestions for altering the regulations for licensing motor vehicles, which the Commissioner of Police has drawn up and privately circulated among those interested in the question for the purpose of obtaining their views on his proposals.

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A Reproach to Civilisation.

It used to be said by a cynic in the early days of railway enterprise that railway accidents would never be diminished in number till a sufficient number of directors had been sacrificed. It is in this way that good sometimes comes out of evil, and therefore we are glad to see that a perfect whirlwind of indignation is sweeping the daily Press, evoked justifiably enough by the accident to Mrs. Trimby on the Portsmouth Road, to which we referred last week. We then said it was nothing short of a scandal that Superintendent Marks should be organising police traps a mile or two away on either side of the scene of the accident without having a single man to regulate traffic at this dangerous point, whose visible presence would have probably prevented its occurrence. It now appears that the scandal was much worse than we then supposed. We are informed, on excellent authority, that the corner at which the accident occurred was right in the very middle of a police trap, that a policeman was actually on the scene, but instead of standing in the road where he might have been able to obviate the accident, he was skulking in the customary manner behind a hedge, and only when the accident had produced its fatal result did he emerge from his place of concealment with apparently some sense of the moral opprobrium attaching to his tactics. There was another police trap in full blast at no great distance on the same road, and Mr. Kirke, one of the victims who was stopped in it, on hearing of the accident, placed his car at the disposal of the police, who accordingly deserted this trap and betook themselves to the scene of the accident when it was too late to do anything. "Here Satan's sole good work deserves insertion": Mr. Kirke was subsequently let off by the Kingston Bench, doubtless at the recommendation of Superintendent Marks, for having in this way assisted the police, and been to some extent instrumental in withdrawing attention from the fact that the accident actually took place in the middle of another police trap.

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Local Indignation and Passive Resistance.

What a scandal the whole thing is! It would be bad enough that a serious accident of this kind, due wholly and solely to absence of all traffic regulations on one of the most important roads in the country and one of the most dangerous corners on it, should occur through numerical insufficiency in the police force. But here are policemen, several of them, actually on the spot and rendered useless for any purposes of good by being concealed for the purpose of, by underhanded tactics, securing fines for mere technical offences. We are glad to see that the subject is exciting not only indignation in the Press, but locally among the ratepayers who defray the cost of the County Police, and that an influential association has been formed with a view of effectively protesting against the withdrawal of the police from their proper duties and their employment in this underhand and useless method of persecution. Indeed, there is talk of organising a "passive resistance" movement against the payment of the police rate—small wonder!

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Almost Too Ingenious.

An example of almost too much ingenuity is provided by the apparatus designed by an inventive Viennese, and on exhibition at the Vienna Exhibition. It consists of a map or chart mounted on rollers which are actuated, one to wind and the other to unwind, by a driving action from the road wheels of the car. The map is so unrolled that, it is stated, it always shows you where you are, the position of your car being marked by a fixed indicator or something of that sort. Where there are obstructions, drains, *caniveaux*, or the like that require you to drive slowly, a depression is made in the map corresponding to a point 500 yards before the car reaches it, and this depression making an electric contact, rings a warning bell, and enables the driver either to slow down very considerably or to look out for bumps. As no similar provision is made on the map for police traps, we may perhaps assume that these institutions are unknown in "Felix Austria." Needless to say, too, the "kartograph," as the invention is termed, is said to form an "infallible" ("infallible" is good) speed recorder; for the motorist has only got to look at his watch as the map rolls by, to know what pace he is proceeding at. There is only, in fact, one thing that the invention wants, and that is something that will prevent the car from proceeding along the wrong road. If this could be done, and a neat device introduced that would let loose a mechanism to enable the car to jump the *caniveaux* and other obstructions after the "kartograph" had heralded their approach, an arrangement would at least be available that should appeal to those in search of sensations.

Electric 'Buses—Are they a Forlorn Hope?

There can be no doubt that the "Electrobus," which, as its name implies, is an electrically-propelled motor 'bus, made a very successful and, except for its sonorous gong, silent progress through the London streets when it was given its first public trial from the Hotel Cecil last week. Its smoothness of running was quite delightful, and its silence equally impressive. Impressive, too, is the smart stage management which brings it upon the scene almost at the exact psychological moment when quite an outcry has been raised in the columns of the daily Press anent the noise of the petrol 'bus, which vehicle, nevertheless, has become so immensely popular. The first "Electrobus" will, it is said, be followed by other "Electrobi" in considerable numbers, and the trial run to which we refer has been followed by an appeal to the public on a very large, and, considering the circumstances, one might almost say, a colossal scale. The prospects of the company, of course, entirely depend on whether it is possible to run a 'bus service commercially in which the motive power is provided by accumulators carried on the vehicle itself. If it is not possible, the whole undertaking is fore-doomed to failure from the start. Frankly, we are convinced that it is not possible, at any rate under existing circumstances, and the reasons why we hold this view we have set forth in an article devoted to the subject, which appears in another column. We have, also, in the interests of the automobile industry, embodied them in a letter which has been reproduced in a number of leading newspapers, including *The Times* and *Financial Times* of Tuesday last.

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Accumulators—the Whole Question.

Without going twice over the same ground, without repeating here what we have said elsewhere, we may again briefly explain that the feasibility of the electric 'bus as a means of catering for traffic is firstly, secondly, and lastly, dependent upon whether accumulators can be made to furnish the necessary energy at a cost which will enable the 'buses to be run at a profit. Figures obtained from those who have the greatest experience in electric traction in the United Kingdom, show that any such hope would be quite chimerical. It is no use imagining that the question can be got round by contracting out. We cannot credit that any of the great firms of accumulator builders, who have the financial solidity necessary to guarantee the performance of any contracts they undertake, would consider the matter for a moment, and if others take it on, the result must be to financially annihilate them, certainly after a moderate time had elapsed, and probably very quickly. And when the supply of accumulators comes to an end, the electric 'buses will come to a standstill.

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Vital Contracts and their Omission.

This aspect of the question leads us naturally to consider the very remarkable prospectus put forward on behalf of the London Electrobus Company, for the most important contract which the company can possibly make is that which relates to the supply and maintenance of the accumulators, and one would expect to find such a contract first and foremost among the contracts referred to and disclosed. It is not there! We have nothing but a nebulous statement by the consulting engineer to the company that the accumulators are to be maintained on mileage contracts "offered from responsible manufacturing firms, which absolutely and definitely leave nothing to speculation," while the amount allowed for maintenance, as we gather from another part of the prospectus, is 3*d.* per car-mile only—an impossible figure, as we show elsewhere. This "offered" contract is, in fact, vital to the whole undertaking, and we cannot possibly imagine (without claiming any special legal knowledge) that its non-disclosure can avoid the effect under the Companies Acts of enabling subscribers, should they so desire, to obtain the return of their money after allotment. Disclosed, however, it is not, and we are not even informed who the responsible firms are, how long the contract is to last for, whether it is supported by any financial guarantee, or whether any penalties against the contracting firm or firms will or can be exacted if they should fail to come up to their stipulations; and yet this is a matter on which the earning capacity of the company will depend much more certainly than on its being furnished with the special 'buses which are so prominently mentioned in the prospectus.

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Some Other Features.

There are other interesting features in the prospectus worthy, at any rate, of passing notice, and principal amongst these is the statement with which it opens, to the effect that the company has acquired—though for 7 years only—a sole licence which the phraseology suggests, though to do it justice does not definitely state, will give a monopoly of electric 'bus traction in London. The essential features of this invention, for which a considerable sum is to be paid, will be found attached to our other article, and we think the merest novice in engineering will admit that, quite apart from whether it is valid or not, it possesses no elements which are more essential to 'bus propulsion than those of any other motor vehicle, or which it is at all necessary to use in order to build an *electric* 'bus. Possibly this is the reason that not a word is said as to its validity.

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Caution, for the sake of the Industry.

We have always made it our special province to warn the investing public against schemes, the prospects of which appeared to us in any way doubtful. This line we adopted, without hesitation, in the early days of the movement when powerful forces were arrayed against us. We have since then had such grim satisfaction as any man can have in looking back on early times, when realising that had his advice been followed, the investing public would have been many thousands of pounds less out of pocket, and the industry have been saved from the disorganisation and want of confidence, which for so long seriously handicapped it in its fight with foreign competitors. Quite recently we have had to adopt the same attitude in regard to more than one motor promotion in which the principles involved were perfectly sound, but in which the dangers were merely those of over capitalisation and over promotion, and in connection with which, sooner or later, the inevitable reckoning would have to be faced. In the present case, however, in addition to these dangers, which are almost bound to be shared by any new motor 'bus promotion on a large scale, there are the much greater uncertainties and risks peculiar to the electric omnibus. During the early days of electric traction, and while there was apparent probability of its becoming one of the leading systems, we invariably did our utmost to promote its interests. Should an independent electric vehicle, therefore, be destined to play a large rôle in catering for public traffic, we should heartily welcome the occurrence. But, in the present instance, we fear that there is but too much reason to anticipate another addition to the list of disasters with which electric traction has been associated.

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The R.I.A.'s Annual Report.

It is a commonplace of moralists and philosophers that much of the world's best work is done quietly and unobtrusively — observations which apply with special appropriateness in the case of the Roads Improvement Association, which is always working away, and working hard, for the benefit, direct or indirect, of automobilists and other road users, and by the very nature of the case much of the valuable and useful work which the Association accomplishes does not come before the public in such a way as to attract the attention it deserves. The Association has now published its annual report, and a fine record of useful work it provides. During the past year, the association has been successful in introducing a Bill into Parliament, one of the features of which is to arrange for the central administration of highways. The Bill was read a first time and printed, and will be introduced in the course of the present year. Further good work was done by the Association as represented by its secretary and Mr. Howard Humphrey, who gave evidence before the Royal Commission on Motor Cars on a number of important questions which are certain to be dealt with in future legislation and presumably in the Commission's Report. Chief amongst these may, perhaps, be mentioned the everlastingly exasperating dust problem, in regard to which a large amount of evidence was brought before the Commission, particularly referring to the exaggeration of the dust nuisance caused by the use of inferior road materials, too much binding material, and inadequate rolling.

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A Dust Fighter.

It is, in fact, on the dust question that a large proportion of the Association's energy has been expended. They it is who are never weary of urging on local authorities to meritorious action and experiment with dustless road materials, and are actually co-operating with surveyors and local authorities in the conduct of experiments, while at the same time performing the useful function of keeping a record of the results attained, the cost of installation and maintenance, and all the other data which are required to enable the rival merits of different systems to be adequately appreciated. The view of the Association is that work of this kind ought really to be done by a Government department, but until the happy day dawns, when things are more or less organised upon this rational principle, the Association is willing and prepared to act, and as a matter of fact does act, as an intelligence department in regard to all matters connected with highway administration. In other directions, too, the Association has done excellent service, and has, by questions and otherwise, kept the matter of highways improvement and administration before the attention of Parliament.

Drunkenness or Brutality?

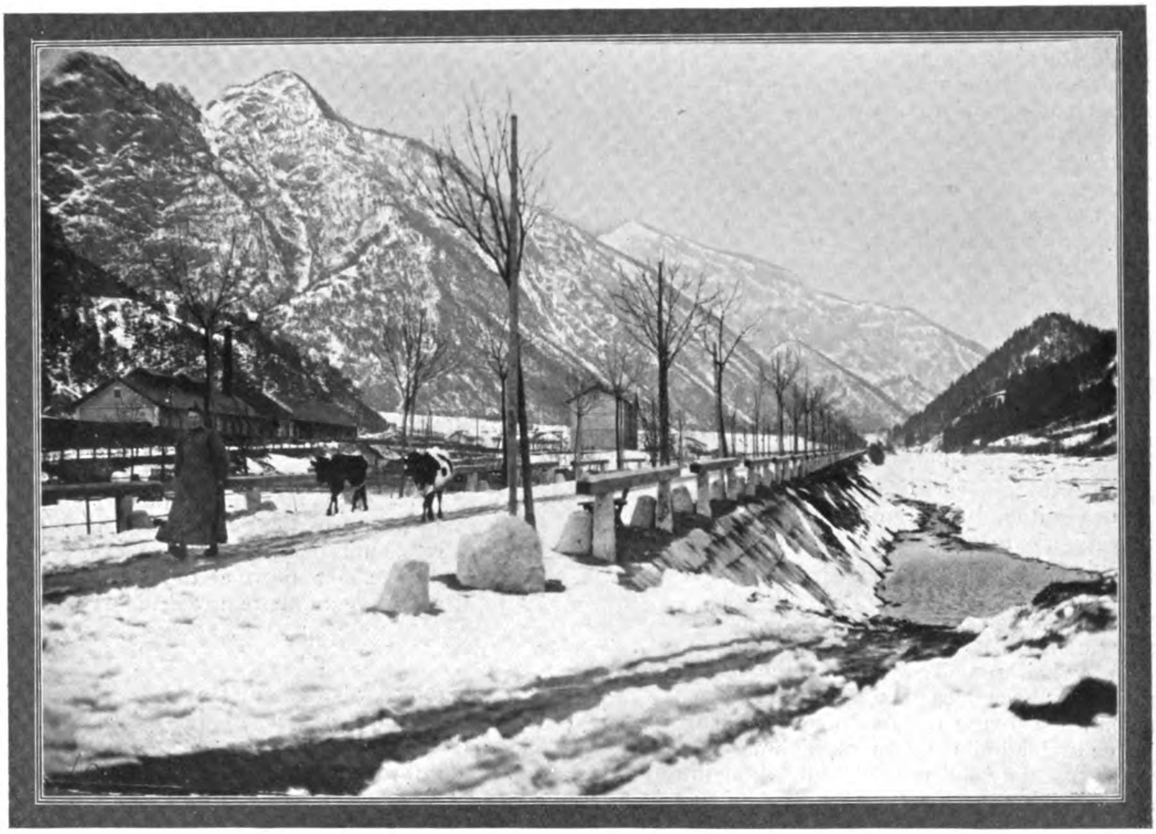
It is not often that when a motorist comes into conflict with the police, the sympathies of all right-minded people are unhesitatingly engaged on the side of the constable, but an instance of the kind came before one of the Metropolitan magistrates recently. A chauffeur was charged with being drunk and driving a motor car, with driving it recklessly, and being concerned with another man, whom he had with him, in assaulting a police constable. By the reports of the evidence, the offender, it was alleged, drove his car on to the pavement, refused to stop when called upon to do so, and when the constable got upon his car, to compel him, pushed him off. The constable then clung to the vehicle, and was carried for 200 yards, when he had to relinquish his hold. Ultimately, when the offender returned by the same road, he was arrested. The constable was considerably injured by his fall from the car, and, as he was unable to attend the court, the driver has been remanded on bail. We do not know whether the particular chauffeur is on the Club list of drivers, but if he is, it is hardly necessary to suggest that, should the facts prove at the trial to be as stated above, it will be promptly removed therefrom.

The Noise of Motor 'Buses from the Art Standpoint.

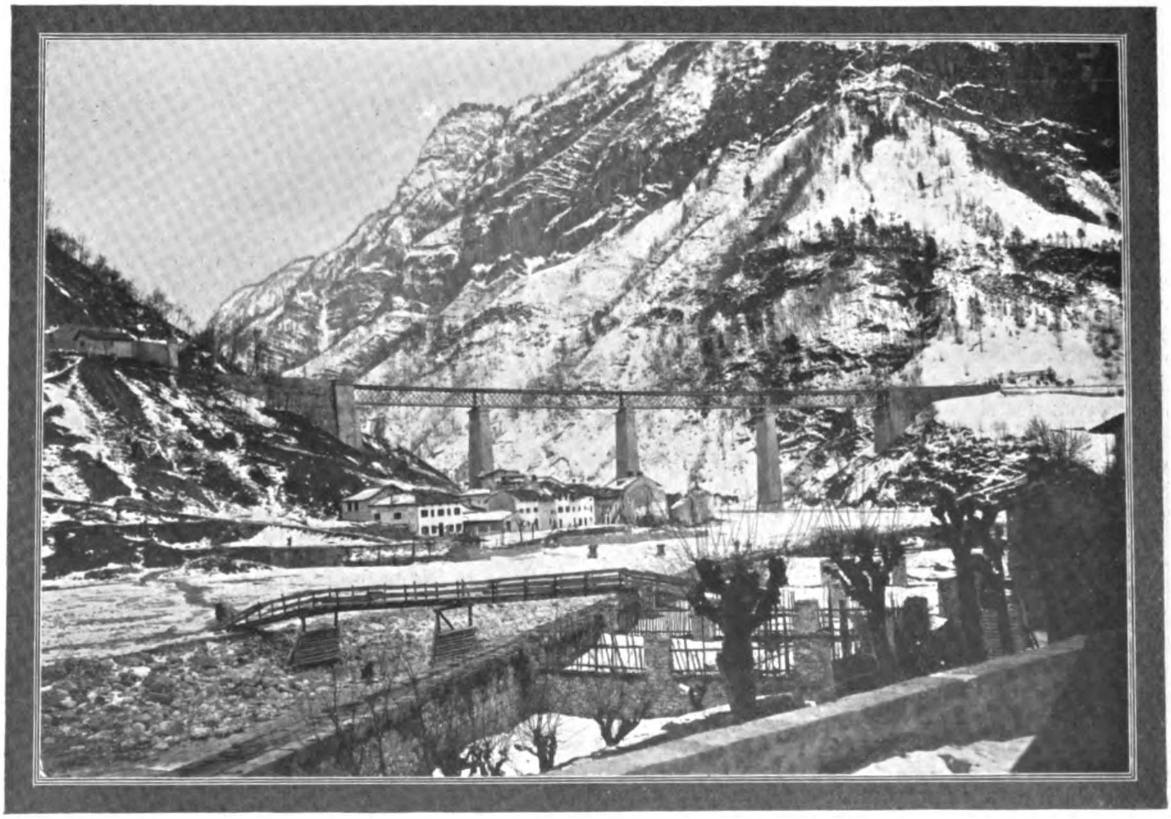
Everyone will agree that a large number of 'buses at present plying in the Metropolis are very much too odorous. As we have often pointed out, this is due first and foremost to their drivers being, as a rule, too "heavy-handed" with the lubricating oil. In addition, many of them are far too noisy, and the noise being mostly due to imperfections in the transmission mechanism, has a general tendency to get worse rather than better, owing to the bumpy character of the streets on most of their routes. The question is becoming a serious one, and much feeling is being engendered among the inhabitants in the streets specially favoured by motor 'buses. Amongst these, Mr. Sidney Colvin, at one time Professor of Art at Cambridge University, and now the head of the Art Department at the British Museum, has given vent to his indignation in a letter to *The Times*. He is very angry, and his anger leads him into exaggeration. The exhaust he terms "noisome steam," and continues, "Have we no power of rebellion, or even of remonstrance, left in us? Are we to be condemned for the rest of our lives to inhale these abominable petroleum fumes at every step?" This is carrying things rather too far, no doubt, but still all well-wishers of the motor 'bus will undoubtedly desire to see the amount of noise it generates reduced, and, above all, the amount of odour it diffuses conspicuous by its absence.

Always Blame the Car.

Two workmen were engaged on a sewer main, in which they were attempting to stop a leakage by the light of an unprotected candle, on the Parade at Sutton Coldfield, when suddenly there was a great bang, the cover of a manhole weighing a quarter of a ton was hurled a considerable distance into the air, all the inhabitants looked with alarm out of their windows, and the hair was singed off the face of one of the aforesaid intelligent workmen. The ordinary uninstructed mind might attribute these phenomena to an escape of gas from a fractured gas pipe. But not a bit of it. The local Press knows much better than that. The explanation, it states, is attributed to the vapour of petrol which had accumulated in the Sewer from motor cars!



INSPECTING THE EUROPEAN CIRCUIT.—The Course between Ugovitz and Sontafel.



INSPECTING THE EUROPEAN CIRCUIT.—Through the Dave Valley beyond Klagenfuhrt.

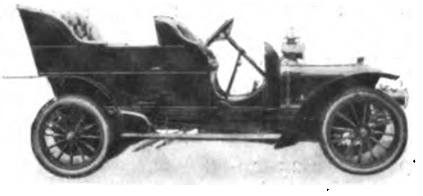
How to Recognise the Cars of To-day.

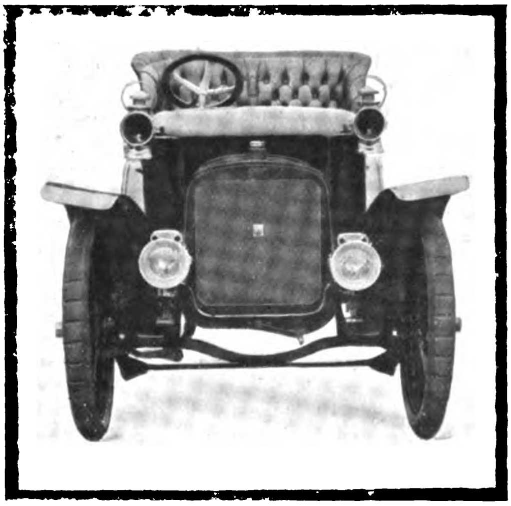
(No. 23).

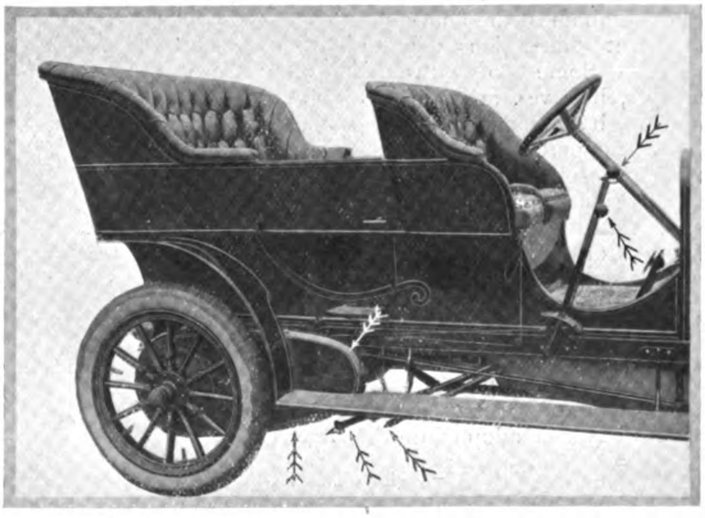
The Sunbeam.

(BRITISH)

12 H.P. & 16 H.P.







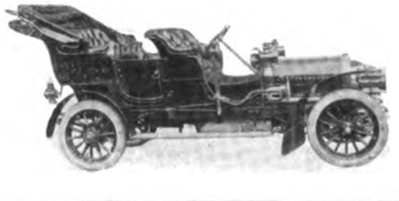
One of the most striking characteristics of these cars is the CHAIN CASE. Other features, however, are the CURVED DASH, the INCLINED KNOBS ON THE SIDE LEVERS, the LARGE RECTANGULAR RADIATOR, and the DOUBLE SPRAG.

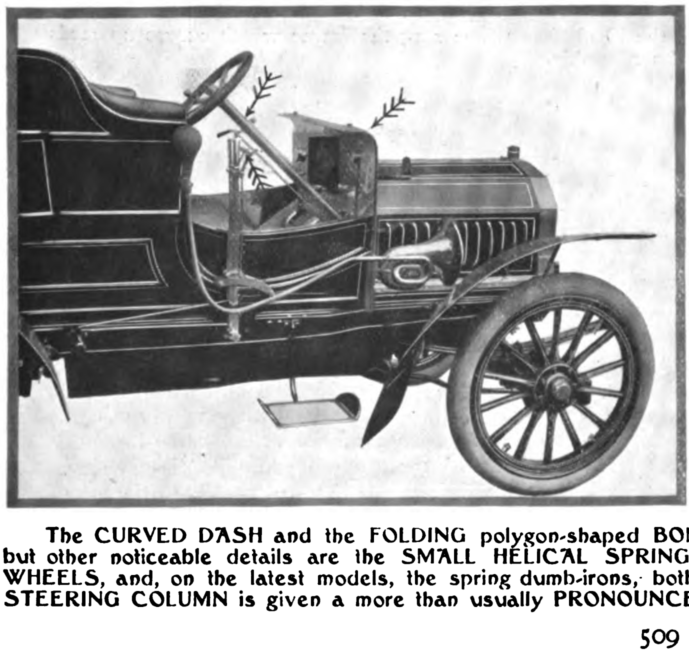
(No. 24).

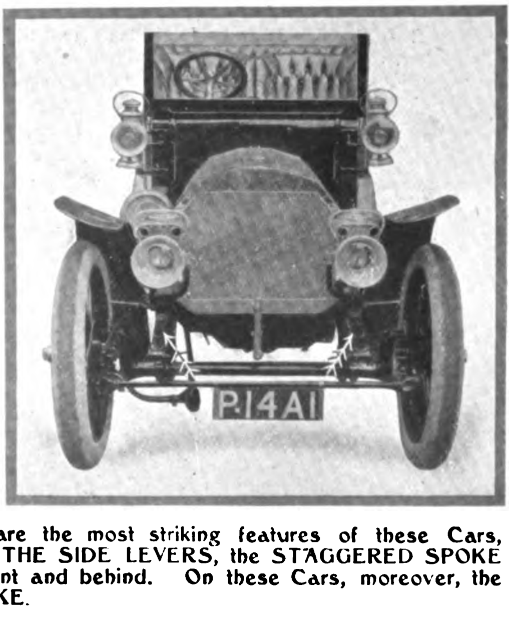
The Dennis

(BRITISH CHASSIS)

14, 20 & 24 H.P.







The CURVED DASH and the FOLDING polygon-shaped BONNET are the most striking features of these Cars, but other noticeable details are the SMALL HELICAL SPRINGS ON THE SIDE LEVERS, the STAGGERED SPOKE WHEELS, and, on the latest models, the spring dumb-irons, both in front and behind. On these Cars, moreover, the STEERING COLUMN is given a more than usually PRONOUNCED RAKE.

THE 1906 HOTCHKISS CARS.

Some radical alterations in detail have been introduced in the new Hotchkiss models, although, in the main, the general design remains much the same as when we described these cars in March and April last year. For the ensuing season the standard models are 25–29-h.p. and 30–35-h.p., but of these it is the latter which embodies the most important alterations in design. Some of the changes, however, are common to both models, not the least important of these being the substitution of a high-tension magneto in place of the low-tension system of ignition previously employed. In respect of their gear-boxes the two models now differ, for while the 25–29-h.p. chassis is still fitted with the "Panhard" type of gear used last year, the "Mercedes" pattern has been adopted on the larger car.

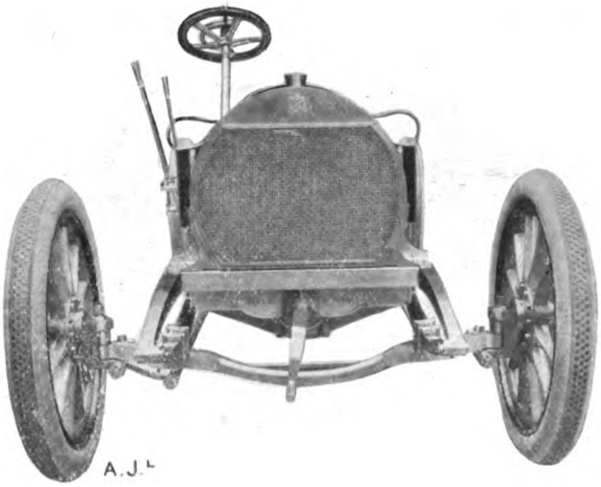


Fig. 1.—The 30-35-h.p. Hotchkiss Car. View from the front showing the new radiator and front axle which has plain knuckle ends instead of being forked.

The 30–35-h.p. Model.

All the most interesting modifications which have been introduced into the design of the 30–35-h.p. chassis are illustrated by the photographs which we now publish, but among these views are some which may be considered as supplementary to our previous series because they show more clearly the construction of certain details which were then in existence.

Chief among the new features of this model is, as has already been mentioned, the gear-box, which is constructed on the Mercedes, or double sleeve, principle. Among gear-boxes of this type, however, the Hotchkiss is peculiar, for it has a centre bearing, B^1 (Fig. 3), in order to give additional support to the engine-driven shaft. Ball-bearings are employed throughout as they were formerly, and four speeds and a reverse, with a

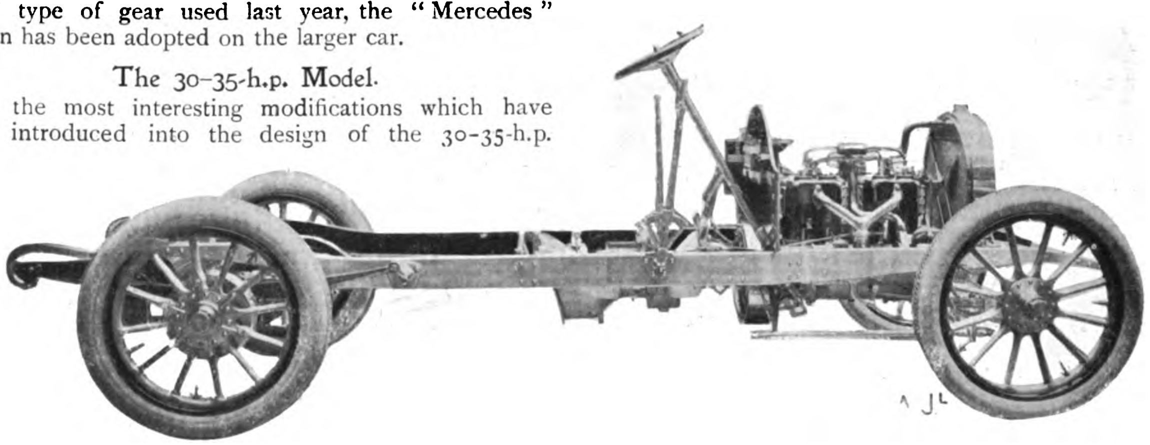


Fig. 2.—The 30-35-h.p. Hotchkiss Car. Side view of the 1906 chassis showing the frame which curves upwards over the rear-axle.

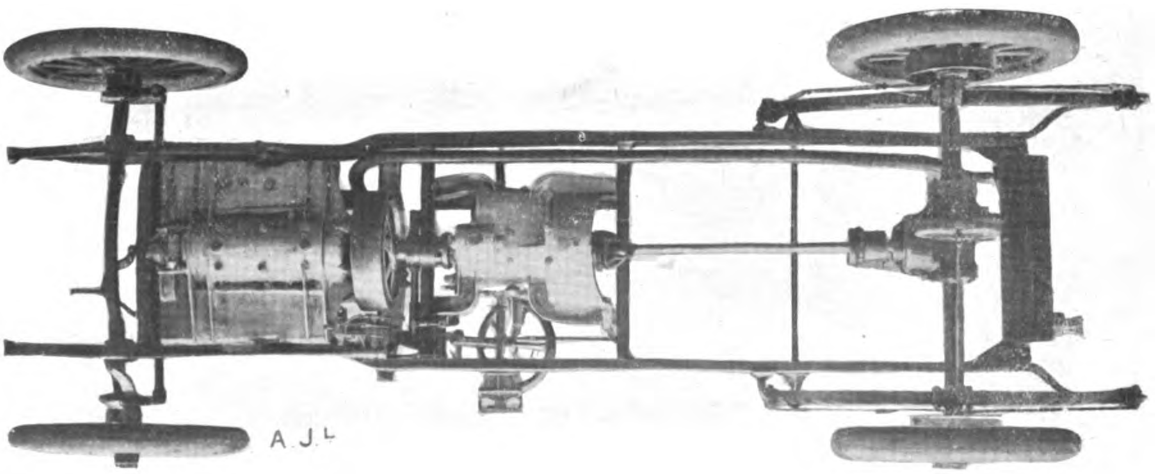


Fig. 3.—The 30-35-h.p. Hotchkiss Car. View of the chassis taken from beneath to show the peculiar construction of the gear-box and crank-chamber.

direct drive on the top speed, are still available. A very neat form of locking gear has been devised for securing the idle sleeves in place. The operating rods lie entirely inside the gear-box and it will be noticed that each rod is provided with two notches, B^3 and B^5. Of these the notch, B^5, is for the change-speed-lever, but the other, B^3, is for the locking rod, B^2. This locking rod passes through the side of the gear-box, and is itself operated from the change-speed lever by the projecting arm, B^4. Fig. 3 renders the details of this construction clearly visible, and it will be noticed that the same attention as before has been given to making the gear-box thoroughly oil-tight.

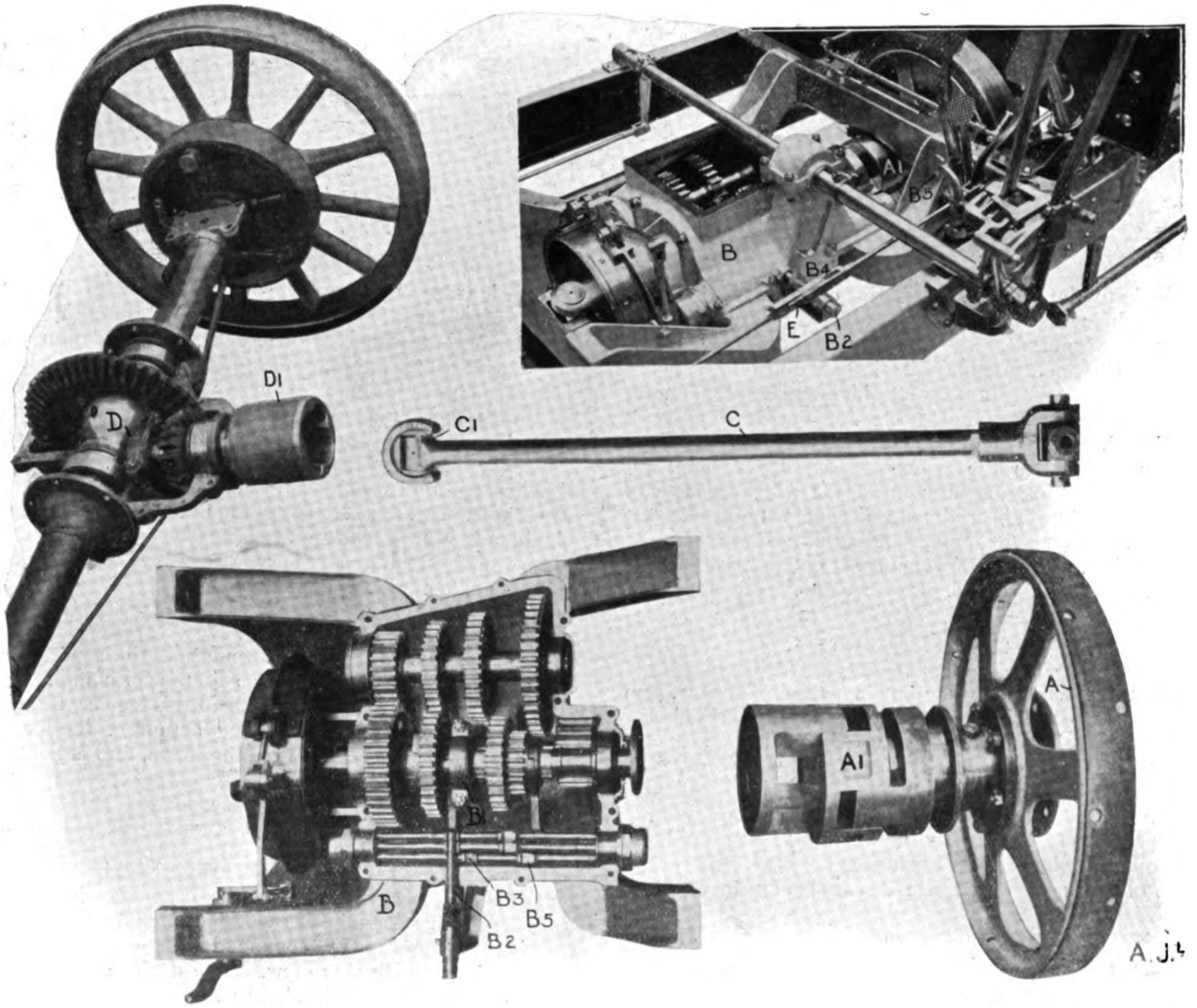


Fig. 4.—The 30-35-h.p. Hotchkiss Car. Views showing parts of the transmission mechanism. Most important of the new features on this model is the Mercedes type gear-box with its central bearing, B^1. The operating mechanism inside the gear-box, the universal-joint at the rear end of the propeller-shaft, and the flexible joint behind the clutch are other interesting points about the car which are clearly illustrated in these views.

Other interesting points on the Hotchkiss car which are also well illustrated in Fig. 4, are the flexible joint, A^1, behind the cone-clutch, A, and the universal-joint, C^1, at the rear end of the propeller-shaft. This latter joint is particularly simple in construction. It merely consists of a segmental block which is pinned to the knuckle end of the propeller-shaft, while the other "half" of the joint, which makes it "universal," is provided by the box, D^1. In addition to being universal, this form of joint is also telescopic, which allows it to compensate for the rising and falling of the back-axle. In Fig. 4 a view of the back axle is also given, and in this the interior bearing, D, for the pinion-shaft is visible. This feature of live-axle differential-gear-casings is extremely important and is now receiving more general recognition. The hub-brakes, one of which is also illustrated in the same view, have not been materially altered in design, but one noticeable modification in detail is that the bracket carrying the shoes is now fixed to the axle-casing instead of being anchored, by short radius-rods, to the frame. Steel cables are no longer used for compensating these brakes, which are now operated by rods, these rods being compensated by a small pivoted beam. The same neat adjustments, E^1, which characterised last year's model are retained in this chassis, one of them being clearly shown in Fig. 3. Radius-rods and torque-rods for tying

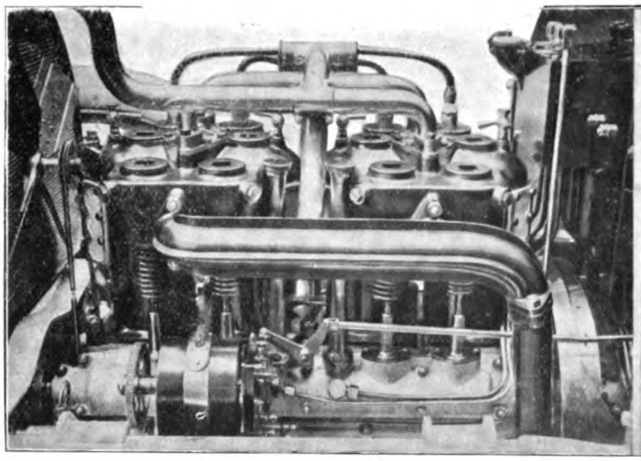


Fig. 5.—View of the new engine of the 30-35-h.p. Hotchkiss Car, showing the high-tension magneto which now replaces the low-tension magneto previously used.

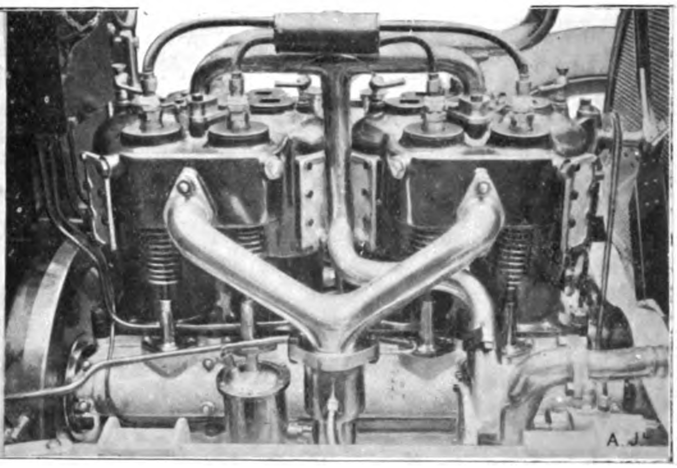


Fig. 6.—View of the engine from the other side showing the new carburettor and the neat fittings for the high-tension wires.

the axle to the frame are still dispensed with, the side-springs being used as before to transmit the drive through their front hinges.

In the engine, the only radical change which has taken place is the substitution of high-tension Eisemann magneto ignition for the low-tension system previously employed. With the exception of the absence of the igniter mechanism the present model is, therefore, not greatly altered in appearance from the previous type, of which we gave illustrations on page 379 of our last volume. Among the minor details, the neat arrangement of the wires, with their bayonet-socket connections to the plugs, visible in Fig. 6, is noticeable, as is also the modified arrangement of the carburettor with its hot water-jacket directly connected to the pump. In the new carburettor there is a needle valve regulation on the jet, and this is inter-connected with the throttle-valve. The Hotchkiss radiator, too, which previously was peculiar among honeycomb coolers, for the fact that its tubes were triangular in section, is now of more orthodox pattern, being constructed of square tubes instead.

Other modifications of importance about the chassis, as a whole, are the lowering of the frame, the sides of which are now bent upwards at the rear, and the alteration of the front-axle, which is now made with plain knuckle ends, as shown in Fig. 1.

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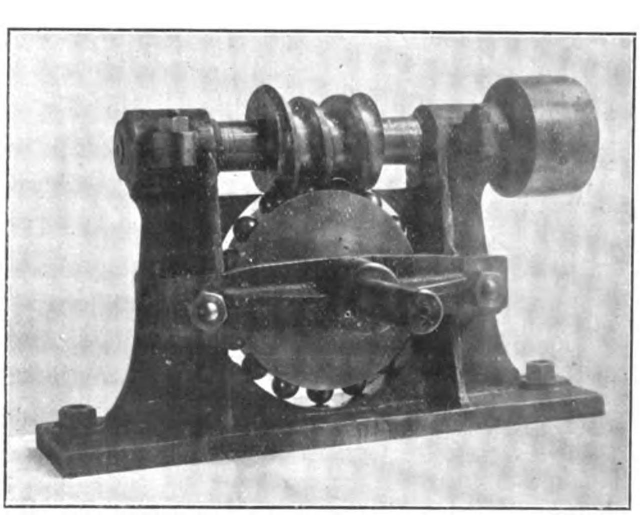
A Novel Worm Drive.

Our illustration represents a model of a new form of worm drive which has been brought out by Mr. Collier—of Collier Tyre fame—for use on motor cars. Its peculiarity lies in the fact that the ordinary worm wheel is replaced by a disc studded on its periphery with steel balls. These balls rest in hemispherical cups, and are retained in place partly by the worm itself and partly by the outer casing which encloses the gear. A special form of worm is, of course, essential, and in order to obtain as many as three teeth in mesh at the same time the worm is made concave to suit the circumference of the wheel. Mr. Collier claims for his device that it reduces wear, owing to the rolling action of the balls over the surface of the teeth on the worm, and is lighter for the same strength.



If Rural Luminaries Had Their Way.

From the Chester Rural District Council comes a particularly poignant wail on the dust question, and drastic remedies have been suggested, including the one to which we are now accustomed of shooting at the motorists' tyres with shot guns. The chairman declared that cattle (nothing is said about geese) now refuse to eat grass within thirty yards of the high road, and proposed to get rid of the trouble by discontinuing the use of the steam-roller, and thus restore the roads to their old-fashioned unattractive condition. But this, we fancy, would prove as little palatable to horse owners, perhaps even less so, than to automobilists, though it is reminiscent of the charming tactics adopted, if we remember rightly, some time ago in Cornwall. As it happened there was a bicyclist on the Chester Rural Council who did not view it with favour, and, perhaps, it will generally be found quite as easy to make the roads dustless as to make them passable for bicycles but impassable for motor cars. One individual suggested that the cost of driving licences should be raised to £20. What a wonderful country it would be if all these local luminaries could be got into Parliament.

THE 35-H.P. NAPIER PETROL 'BUS.

So closely is the "Napier" name associated with high-class pleasure vehicles, and with high-speed marine engines, that it will doubtless come as somewhat of a surprise to many of our readers to learn that this enterprising British firm are also building motor omnibuses for public service work. As a matter of fact, however, it is no new departure for them to manufacture heavy commercial vehicles, and, indeed, it was on May 17th, 1902, that we gave an illustrated description of their first petrol lurry. Since that time the steady and consistent study which has been devoted to the industrial vehicle problem by Mr. Napier and his staff at the Acton works has naturally led to the production of a very different type of chassis to that which was then turned out, but we learn that even that early 16-h.p. machine is still running and continues to do its regular routine of work.

Specially designed to take a double-deck 'bus body, the latest chassis is of very substantial construction throughout, as can be seen from the accompanying illustrations, which show it from various different points of view. It has, moreover, several novel features that distinguish it from all other vehicles of this kind, as well as from every other Napier model which has figured in these pages in the past. Amongst these may be mentioned the cooling system, with the curiously shaped water-jackets above the cylinders, the disk clutch, and the large tubular propeller-shaft that connects the gear-box with the differential countershaft.

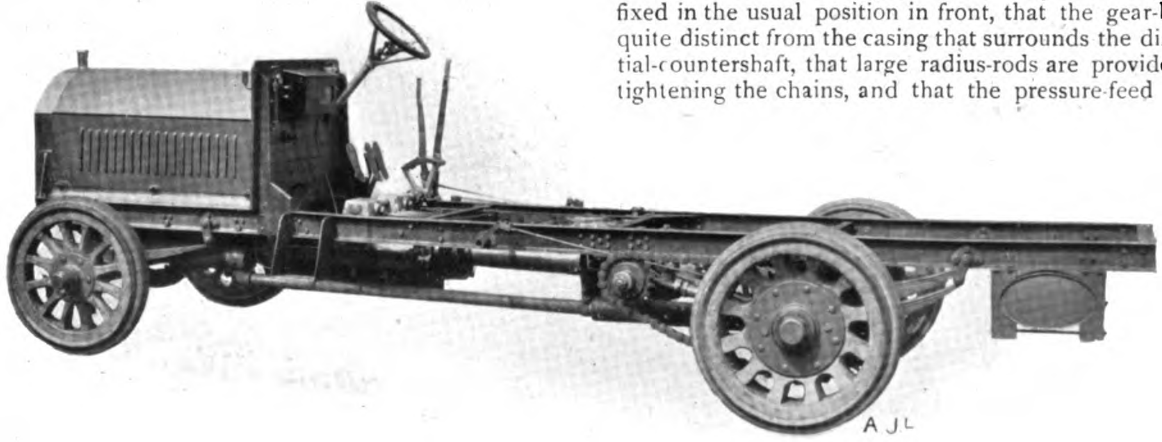


Fig. 1.—View of the 35-h.p. Napier 'Bus Chassis from the "near" side.

In Figs. 1 and 2, which show the chassis from the near side and from above, respectively, it will be seen that it is of the chain-driven type, that the 4-cylinder engine is fixed in the usual position in front, that the gear-box is quite distinct from the casing that surrounds the differential-countershaft, that large radius-rods are provided for tightening the chains, and that the pressure-feed petrol tank (which has a sufficient capacity for running 100 miles) is fixed beneath the frame at the extreme rear. The frame itself is strongly built up of 5 in. by 3 in. channel steel, and is supported above the large axle-forgings on four semi-elliptic springs, the shackle-pins for which are provided with lubrication screws. Plain bearings are used for the front road wheels, but the driving wheels are carried on special ball-bearings, in order to reduce friction as far as possible. Solid rubber tyres are fitted to all four wheels, those in front—which are given a very wide steering lock—having single 5 in. tyres of 32 in. diameter, while each of the rear wheels is shod with a pair of 36 in. by 4 in. tyres. With a wheel-base of 12 ft., the track is 6 ft. and 5 ft. 7¾ in., at the rear and in front, respectively, and the overall dimensions of the main-frame are 18 ft. 10⅝ in. (long) and 3 ft. 7¾ in. (wide).

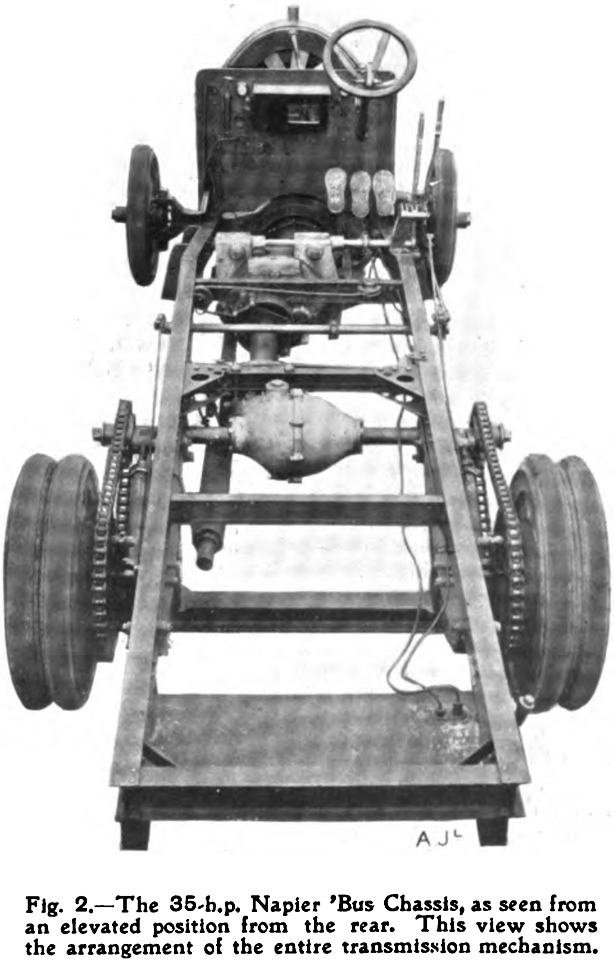


Fig. 2.—The 35-h.p. Napier 'Bus Chassis, as seen from an elevated position from the rear. This view shows the arrangement of the entire transmission mechanism.

Referring to Fig. 3, which is a view of the engine from the "off" side, attention will at once be drawn to the domes, A, that are prominent above each of the four cylinder-castings. They project well up above the top of the combustion-chambers and ensure the presence of a large body of water immediately around the cylinder-heads. But for them, the cylinder-castings would call for no special comment, since the inlet-valves on the "off" side and the exhaust-valves on the "near" side are placed symmetrically with high-tension ignition-plugs fitted into all eight inspection-covers. Very great care has, however, been taken in order to guard against over-heating when working in heavy traffic, and it is also with this object in view that the extra large tank, A^1, is arranged above the fan-cooled radiator. This tank is above the level of the cylinders, and there is therefore a strong tendency for a rapid natural circulation to take place when the centrifugal pump is running extremely slowly. The water enters the cylinder-jackets in the neighbourhood of the exhaust-valve chambers and returns direct to the radiator from the top of the domes, A. In the radiator itself, the water passes down the vertical finned tubes.

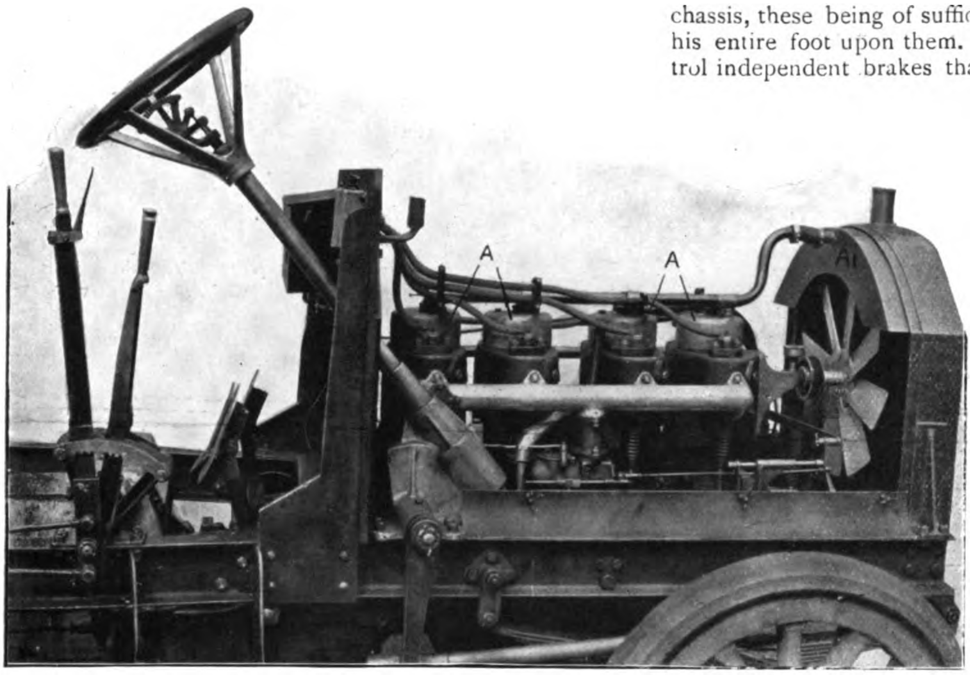


Fig. 3.—The front portion of the Napier 'Bus Chassis, showing the 35-h.p. engine from the "off" side.

Those ignition-plugs which lie above the exhaust-valves are operated by a high-tension magneto, fitted well forward on that side of the engine, whereas the other ignition-plugs are used in conjunction with the usual "Napier" battery system, the commutator and distributor for which are driven by a chain on the dashboard. The magneto is gear-driven from the cam-shaft, and the water-pump is mounted on the front end of the same shaft. Another pump is also fitted to the engine, this being an oil-pump, which automatically lubricates the engine; it is driven by a worm that forms a part of one of the cam-shafts.

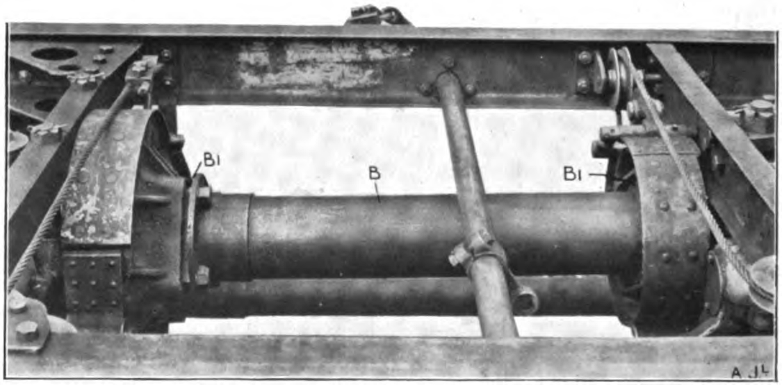


Fig. 4.—View of the large tubular propeller-shaft which transmits the power from the gear-box to the differential-countershaft on the Napier 'Bus Chassis.

The cylinders have a bore and a stroke of 5 in., and the engine is intended to run at a normal speed of 1,000 revs. per min. Its power and speed are usually regulated by hand from above the dished steering-wheel, as seen in Fig. 3, but an automatic governor is also provided for acting direct upon the throttle.

There are three curiously shaped pedals on this chassis, these being of sufficient size for the driver to rest his entire foot upon them. The two outer pedals control independent brakes that are fitted at each end of the propeller-shaft, B, as seen in Fig. 4, and the pedal on the left controls the clutch. One brake-drum is fitted upon the rear end of the second-motion-shaft, close behind the gear-box, and the other is fixed to the front end of the short shaft that carries the bevel-pinion inside the differential-casing. Both brake-drums form the outer members of the cardan-joints that constitute flexible couplings for the abnormally large tubular propeller-shaft, B, this shaft being fitted with large square coupling-blocks, B', at each end. Three forward speeds and a "reverse" are rendered available by a single lever working in a "gate" type of quadrant. Inside the gear-box, both shafts run in ball bearings. The differential countershaft is constructed in much the same way as an ordinary live-axle, for the central casing is bolted to steel tubes that enclose the two live shafts throughout their length, and the sprockets revolve on ball bearings which are fitted outside the extreme ends of these tubes. The pull of the chains is thus taken by the stationary tubes and there is no lateral strain imposed upon the inner driving shafts. Another important point about the countershaft is that it can, if necessary, be removed without disturbing the 'bus body.

THE NEW ERA FIRE EXTINGUISHER.

Among everyday substances, nothing is more inflammable than petrol, and nothing is less easily extinguished when once alight. Ordinary water is useless, except where its mere volume smothers out the flame, because the burning petrol can float upon the surface. Sand is more efficient on account of its absorbent properties, but it is an impracticable agent in most cases of fire connected with motor cars. There remains only the chemical extinguisher, among the present day appliances, which has accomplished any satisfactory results. Ordinary chemical extinguishers operate, as is well known, on the principle that sulphuric acid poured into a saturated solution of soda in water instantly generates carbonic acid gas, which has powerful fire-extinguishing properties. The usual methods of operation are to break a sealed bottle of acid in a closed vessel containing the alkali solution, and to utilise the pressure of the gas thus generated for forcing out a jet of carbonic acid gas-impregnated water upon the flames.

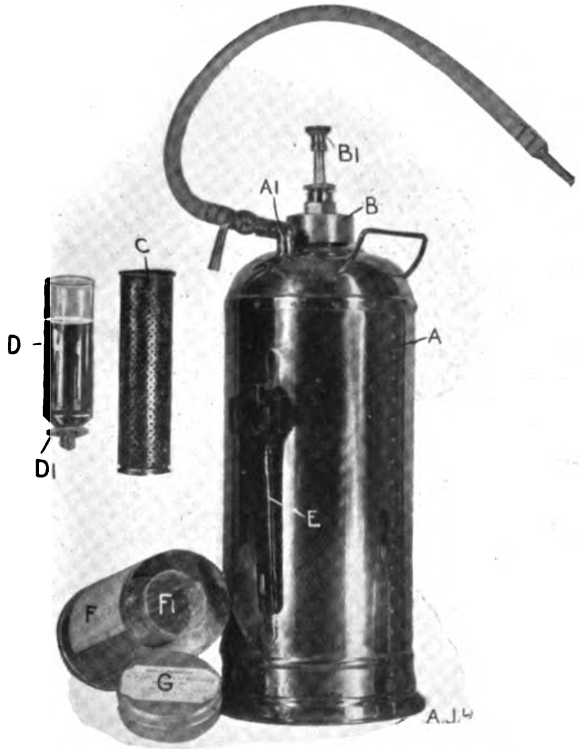


Fig. 1.—The New Era Extinguisher. Photograph showing the complete outfit. By the side of the reservoir are two canisters containing the recharge, above is the acid bottle, D, with its cage, C.

While carbonic acid gas generated in this manner provides a very valuable and cheap form of extinguisher for ordinary fires, yet its range of utility appears to be somewhat limited when applied to the suppression of ignited petrol. Very considerable success in this direction, however, has been accomplished by the Valor Company, of Birmingham, who are the manufacturers of the New Era Fire Extinguisher. It is an apparatus constructed and operated upon exactly the same principle as an ordinary chemical extinguisher, except that a special alkali preparation containing some twelve distinct chemicals is used instead of soda. By this means the Valor Company claim that they can generate a fire-extinguishing gas at a much higher pressure. It is this high pressure which plays such an important part in the successful extinction of petrol flames, because it enables the jet to drive the fire before it so much more effectively. Besides giving a much better control over the spreading of the flames, the gas liberated necessarily occupies a greater space when it has expanded to atmospheric pressure, consequently the fire-extinguishing properties of the apparatus are increased from both points of view.

The apparatus itself, of which we give illustrations, consists of a strong copper drum, A. This is fitted with a suitable handle, and also with a union and tap, A^1, for the attachment of a short length of hose. It is, of course, intended that the type illustrated in Fig. 1 should be carried in the hand, but that illustrated in Fig. 3 is for fixing to the side of a boat, and if made permanent by the use of the brackets, A^2, constitutes, we are informed, a very strong inducement to a rebate on the usual insurance premium.

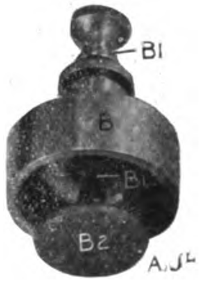


Fig. 2.—The New Era Extinguisher. View of the cap, B, which carries the plunger, B^2, by which the acid bottle is broken and the apparatus set in action.

Loosely fitting inside the neck of the cylinder, A, is a perforated metal cage, C, which holds the sealed bottle of acid, D. There are spikes attached to the bottom of the cage, but the bottle, D, rests on a rubber washer, D, which prevents its accidental breakage. When packed for transit, the bottle is carried in the inner chamber, F$'$, of the tin, F, containing one of the alkali powders. Besides the powder in the tin, F, however, there is another powder in the smaller tin, G. Both powders are thoroughly mixed into the water which fills the reservoir, A, the acid bottle is put in place, the cap, B, screwed home, and the extinguisher is thus charged ready for use. Passing through the cap, B, is a spindle, B^1, which is attached to a hammer, B^2, at its inner end. When the apparatus has to be set in operation, the spindle is forced sharply inwards, and the

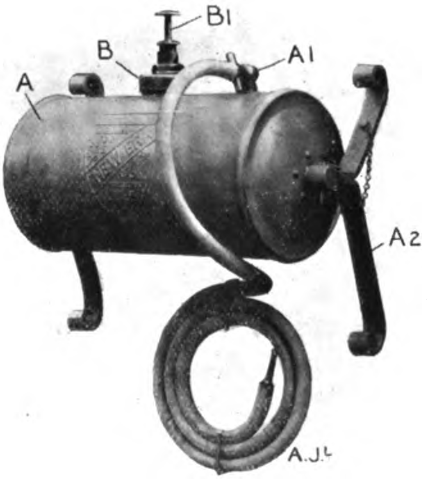


Fig. 3.—The New Era Extinguisher. View of the type which is designed for use on boats.

acid bottle is broken by the blow, for the hammer, B², is immediately above it.

Chemical combination takes place between the acid and alkali solution, and a pressure of 250 lbs. per sq. in. is instantly generated in the reservoir. Upon opening the tap at A¹, a fine jet of frothy liquid can be thrown upon the fire, and if properly handled, the suppression of any reasonable conflagration should only be a matter of seconds. In fact, the contents of a cylinder only last a minute or so, according to capacity, and the apparatus would be useless unless it took immediate effect. If necessary, the tap at A¹ can be shut while the vessel is under pressure, and the remaining contents will still remain available during a limited period.

Frequent demonstrations of the efficacy of the New Era device have been made in public, and one of the most recent was given by permission of Mr. Smith at the premises of the Motor Academy, on Wednesday, April 11th. Three barrels saturated with paraffin and petrol were placed close together, and inside the centre barrel was an open can full of petrol. A gallon of petrol was poured on the ground about the barrels and the whole ignited; the flames were put out in 30 seconds by a single extinguisher. We are informed by the Valor Company that the General Petroleum Company, before whom the trial was made, had specified this particular test on several other occasions—because it approximately represents a fire on a delivery van carrying petrol—but had hitherto been unable to find any form of extinguisher capable of putting out the flames at all. It is extremely noteworthy, too, that the New Era devices are used extensively by practically all the large 'bus companies, who fit them on their motor vehicles as well as in the garage.

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When England was like "Sleepy Hollow."

Friday, in last week was the bicentenary of the day in which the first stage coach ran from London to York in what was doubtless then the record time of four days. It requires a really violent effort of imagination to in any way realise the idyllic conditions of life in the British Islands when "My Lord Castlewood journeyed from London to Cambridge, lying a night on the road, before the new swift coaches were established." The following notice which was published at the time, and for which we are indebted to the *Daily Mail*, provides a suggestive commentary on the times:—

YORK FOUR DAYS'
Stage-Coach.

Begins on Friday, the 12th of April, 1706.

All that are desirous to pass from London to York or from York to London, or any other Place on that Road, let them repair to the Black Swan in Holbourn in London, and to the Black Swan in Coney-street in York.

At both which places they may be received in a Stage-Coach every Monday, Wednesday, and Friday, which performs the whole journey in Four Days (if God permits), and sets forth at Five in the Morning, and returns from York to Stamford in two days, and from Stamford by Huntington to London in two days more, and the like Stages on their return.

Allowing each passenger 14l. weight, and all above at 3d. a pound.

Performed by { BENJAMIN KINGSMAN.
HENRY HARRISON.
WALTER BAYNES.

Also this gives Notice that Newcastle Stage-Coach sets out from York every Monday and Friday, and from Newcastle every Monday and Friday.

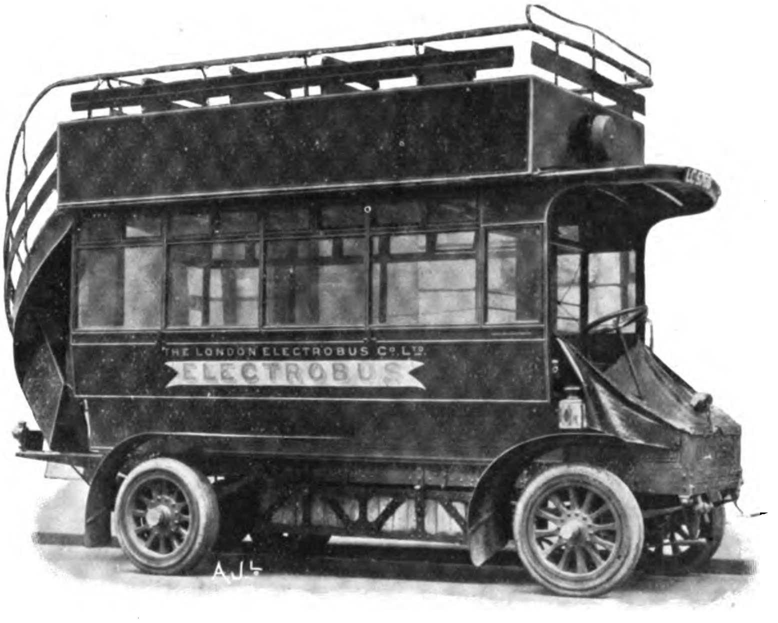
THE TARGA FLORIO RACE IN SICILY, MAY 6.—The picturesque village of Petralia-Soprana.

THE "ELECTROBUS" AND ITS FINANCIAL PROSPECTS.

A company—the London Electrobus Company—has been formed, with a capital of £100,* for taking over certain options and contracts of the International Motor Traffic Syndicate, and for the purpose of running a service of electric 'buses in London. Their first vehicle, which is not yet actually in commission, made a few demonstration runs on Wednesday, April 18th, and, it is stated, that it is intended to place about 200 of these vehicles on the streets as soon as possible.

Prospects of the Electric 'Bus.

To the uninitiated there is a most desirable simplicity in the appearance of an electric 'bus, and this is undoubtedly enhanced by the silence, absence of smell, and easy motion, which are of course common to all such electric vehicles. To those who know more about these matters there are unlimited possibilities for trouble, however, in that great battery-box which hangs beneath the frame and supplies the energy by which the motor is enabled to drive the 'bus. This battery question has always been the crux of the situation as regards the use of self-contained electric vehicles, because it alone involves an item of expense which is so great as to absolutely mar all prospect of success from a commercial point of view, except in an extremely limited and well-defined field. Many private persons own electric town carriages, but they are an expensive luxury, and were it not for the scientific management of such companies as the Electromobile Company, who undertake the entire upkeep of the electric carriages which they sell, they would not be available even at their present rates. Under what circumstances this luxury of the rich is to be provided for the general public on a sound commercial basis it is difficult to see, yet one thing is certain, the London Electrobus Company has been formed for the purpose, and it is, therefore, of the utmost importance that our readers should be put in possession of the essential facts that relate to any such scheme. No journal devoted more attention to the self-propelled electric vehicle industry in those early days, when the question of its future prospects was still undecided, than did The Automotor Journal, and none would welcome more, any change in the situation which would give electric 'buses a fair chance of success at the present day, but, unfortunately, there are no grounds whatever for being so sanguine.



The "Electrobus."—View of one of the new electric 'buses with which it is proposed to start a service in London.

Running Costs.

In order that a service should be successful, it is obvious that it must be able to compete on a reasonably even footing with the petrol 'buses now running. It is unnecessary—more especially in the light of the numerous papers on the subject recently delivered before scientific institutions, and re-printed in the columns of The Automotor Journal—to go at any length into the cost of up-keep of motor 'buses, but as some numerical comparison offers the most lucid explanation of the case, we will take the figures that have been generally accepted by those who ought to know. Thus it may be said that 10*d.* per mile per 'bus is a fair estimate of running cost for a petrol 'bus. There will obviously be certain items in the management of an electric 'bus service which may be considered as equivalent to corresponding details in a petrol motor 'bus service. Traffic expenses, including wages, tickets, uniforms, &c.; and general expenses, including salaries, rents, stationery, repairs, &c., are among the costs which may be taken as the same in both companies. Mr. Manville, in his recent paper, gives data in which these sections of total expenditure may be written down as approximately 4½*d.* per 'bus-mile, and interest on capital may, for the moment, still be considered as ½*d.* per mile. Tyres might be a little cheaper on the electric 'bus on account of its more even driving strain, but as this item is, nowadays, a matter for contract, it would be unwise to assume any great difference, so in both cases it may be considered as 2*d.* per 'bus mile. Depreciation of the machinery would no doubt be less with the electric 'bus, but in Mr. Manville's example of the petrol motor vehicle, nearly 2*d.* per 'bus-mile is allowed. This is at the rate of 20 per cent. per annum upon the value of the vehicle, and it would, therefore, be at least 1*d.* per 'bus-mile with the electric vehicle. This leaves the sum of 2*d.* per 'bus-mile out of the 10*d.* for petrol vehicles with which to maintain and re-charge the accumulators.

Re-charging Expenses.

If the vehicle weighs 6½ tons, and runs at a speed of, say,

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* This article was written immediately subsequent to the trial run on April 18th, but prior to the issue of the prospectus in which the capital has been increased to £305,000 by the creation of 299,900 ordinary and 5,000 deferred shares of £1 each. At that time, too, we were unaware of the extent to which any public issue was intended, or of the date at which the prospectus would make its appearance. Our criticisms of the prospectus itself will be found in our leader columns.

12 miles per hour on a town road—where the co-efficient of traction is, say, 60 lbs. per ton—it will require a constant expenditure of energy (electricity) of nearly one unit per mile. At the present time the lowest price of electricity in bulk, from the supply companies, is 1*d.* per unit, so that the theoretical minimum cost of the electricity itself is 1*d.* per mile. It may be as well to draw attention to the fact that this figure is obtained mathematically, without regard to the excellence or otherwise of any special accumulators, motors, or machinery. It is also obtained without any allowance for the usual theoretical efficiencies, and as it may be taken for granted that there is no plant on the market which could give an overall efficiency, between the electricity-meter and the wheels of the vehicle, of more than 50 per cent.—experience shows it to be nearer 30 per cent.—electricity would, therefore, cost the consumer at least 2*d.* per mile per vehicle for the current alone. This sum, it will be noticed, just uses up the whole of the surplus that is available, in the comparison with the petrol 'bus, the running costs therefore standing at 10*d.* per 'bus mile for the items hitherto specified. This re-charging current is equivalent to the petrol used on a motor vehicle—although that costs only about 1*d.* per 'bus mile—and so far the comparison would be very satisfactory to the electric vehicle if there were no additional item of expense peculiar to it. Accumulators unfortunately are, however, extremely delicate, and need constant attention as well as frequent renewal. In this connection it is interesting to note that the experienced companies already established have found the inclusive cost of current and maintenance to be 6*d.* per car-mile for private broughams, and on this basis the sum of 4*d.* per car-mile is approximately the cost of maintenance only. Obviously, however, the cost of maintaining the much larger batteries needed for electric 'buses is bound to be very much greater—possibly four times greater—and it will thus be seen that the electric 'bus cannot possibly compete with the petrol 'buses of to-day on the score of cost.

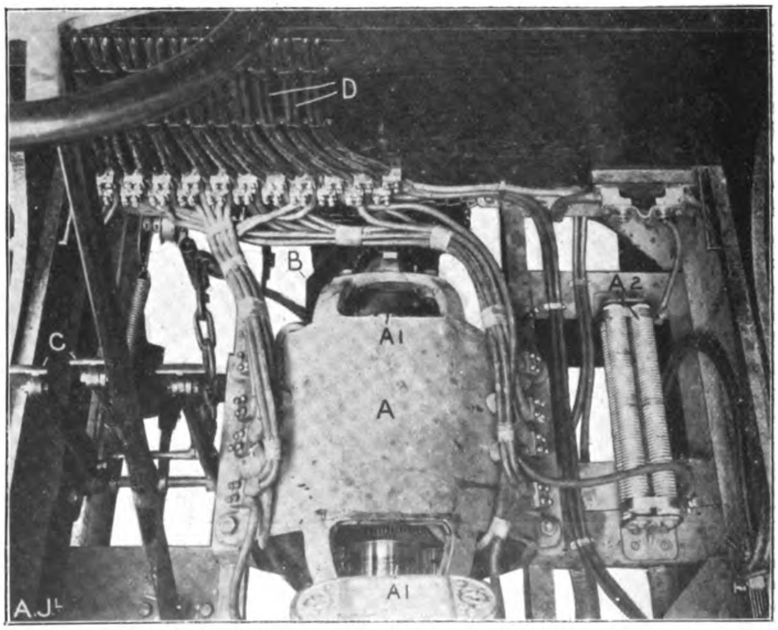
Estimated Cost of Up-keep.

From figures given to the Press by the consulting engineer—Mr. W. J. Crampton—of the London Electrobus Company, it appears that they are allowing only 6*d.* per 'bus-mile for all expenses other than those connected with the accumulators, for which they are allowing no more than the totally inadequate sum of 3*d.* per 'bus-mile. The actual maintenance of the accumulators they presume they can contract out at 2*d.* per 'bus-mile, while they pay the actual electricity bill with the other 1*d.* per 'bus-mile. It is said that there is at least one company willing to undertake the contract for the maintenance of the accumulators at the above rate, so that the current bill might, on their showing, even cost the 2*d.* per 'bus-mile—which, as we have shown, is the minimum necessary—and the 'bus company would still only have a total estimated expenditure of 10*d.* per 'bus-mile. This ingenious scheme for apparently keeping the running costs within limits, carries no conviction, because it seems to us morally certain that no accumulator company could exist on the terms prescribed if they accepted the contract. Without the accumulators, the 'bus company must also cease to exist, and the whole scheme falls to the ground.

We have gone at this length into the various aspects of the question because of the numerous statements, based upon the information supplied, which have appeared in the daily Press. These statements are obviously written by those who have not fully grasped the technicalities of the subject, and they are of an exceedingly dangerous, although unintentionally misleading, character because they might influence the lay public in investing their money in an undertaking for which there is, in our opinion, no probability of a profitable result. As an example of how little these matters are generally understood, one instance might be quoted; we have actually seen it stated in the daily Press that the "total expenses of running for the day are put at 30*s.*, the earning capacity of fares being £6 to £7."

Mechanical Features of the 'Bus.

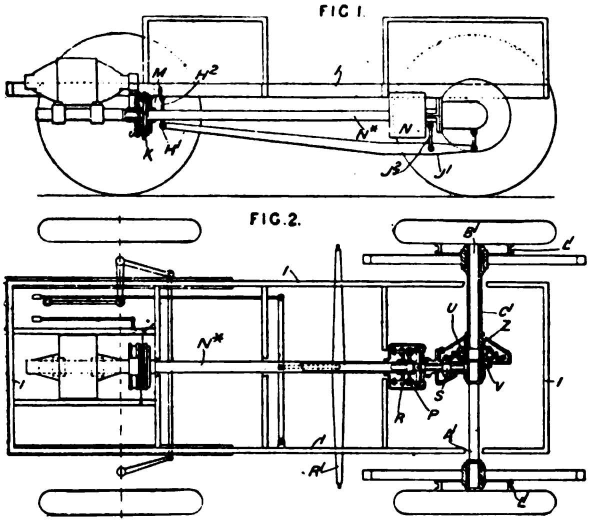
Each of the new 'buses is equipped with one four-pole motor situated under the floor-board in front. Our illustration shows its general arrangement in the chassis, the motor, A, being carried by cross-members from the main frame. There is a commutator, A^1, on each side of the armature, and two separate windings on the core, thus virtually making the single motor equivalent to two smaller machines so far as the electrical connections for obtaining the various speeds are concerned. Underneath the driver's seat is an ordinary rotary controller, and the wires, D, pass from this to the motor, as shown in our illustration. Lying longitudinally beneath the motor is a long propeller-shaft, which is driven by the motor through a Renold silent chain. The propeller-shaft drives the rear-axle by means of bevel wheels. There is no casing round the entire live-axle, but there is a casing round the central portion. One of the rear wheels is fixed directly to a shaft which runs right through to the other side, and the other wheel



The "Electrobus."—View showing the electric motor in place on the chassis. It is situated under the floor-boards in front, and the controller is under the driver's seat.

is fixed to a sleeve which rides on that shaft. In this way the necessary rigidity for supporting the differential is obtained without the use of a long casing; the actual bearings for the axle are independent of one another, being attached separately to the springs. The battery-box is slung immediately below the frame.

The British patent under which the chassis is, we understand, constructed, is No. 3,653 of 1902, being the invention of La Compagnie Française des Voitures Electromobiles. Apart from the arrangement of the live axle, to which we have already referred above, the special feature appears to be the provision of the long torque-rod that ties the axle-casing to the chassis, and tends to keep the propeller-shaft in a direct line from end to end. We reproduce two drawings from this specification.



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Diagrammatic drawings (side elevation and plan) showing the arrangement of the motor and the transmission-mechanism on the electric chassis referred to in the British Patent No. 3,653 of 1902. These drawings accompany that patent specification, which relates to an invention of La Compagnie Francaise des Voitures Electromobiles.

Battery Changing.

In order not to detain the 'bus while the batteries are being re-charged, spare sets have to be provided to replace them. Owing to their extreme weight, however, it is impossible to remove or replace a battery from a chassis without some form of special machinery. It is thus virtually necessary to do this changing of batteries at the charging station itself, and this is an important point, because the station is hardly likely to be very near the route. It is apparently assumed that only three minutes is required to change a set of batteries, but this is obviously an inadequate estimate of the total useful time involved in the operation.

The average normal current consumption is, it is said, about 120 amperes (approximately in agreement with deductions made from our assumed basis), which at a five-hour rate would necessitate accumulators having 600 ampere hours' capacity. There would thus have to be two sets of accumulators for each 'bus in order to enable it to run ten hours per day, but as each such battery could hardly weigh less than 2 tons, it might be found advisable to employ three sets of smaller cells instead. This would, however, necessitate a higher rate of discharge, and a more rapid depreciation of the cells. Under these circumstances there would always have to be three times as many batteries as there are 'buses; with a service of say 200 'buses this would necessitate a stock of 600 batteries, of which the aggregate weight would be, say, 800 tons. To keep these in proper repair and to provide the necessary renewals, the accumulator company are estimated to receive 2*d.* per 'bus-mile. It will be remembered that some figures already given show that companies having experience with private electric carriages find the depreciation of the batteries to be 4*d.* per car-mile. These smaller vehicles run under very favourable conditions, and for such short distances only one battery is required per vehicle, but neglecting the possible difference in treatment and considering only that of size it will be found that while the single small battery weighing, say, 10 cwt., costs 4*d.* per mile for depreciation, only 2*d.* per mile is to be allowed for the depreciation of the larger batteries which weigh 2 tons!

In conclusion, it may be as well to remind our readers that the self-contained electric public service vehicle is no novelty, and that two of its most notable failures occurred in this country, in connection with the London cabs and the Birmingham trams. Both these classic examples offered greater initial chances of ultimate success than can be expected from any motor 'bus service, even at the present day; for there has been no such radical development, to our knowledge, in connection with accumulator manufacture as would be necessary to convert the certainty of failure into even the possibility of success.

* * *

Stopping Reaction.

The West Sussex County Council some time ago applied to the Local Government Board for powers to "dismain" certain main roads in the county. When a road is "dismained" it is repaired in a different manner, more cheaply, of course, and soon ceases to provide an agreeable surface for travelling on. It will hardly be believed that the West Sussex County Council included amongst the roads it desired to be treated in this manner a portion of the main London and Portsmouth Road, and a portion of the London and Chichester Road, both among the finest main roads in the country. The Roads Improvement Association opposed the application, but the Local Government Board refused to hear them, on the ground presumably that they had no *locus standi.* Objection to this ruling was lodged with the Board, and a new inquiry into the whole question asked for. In the meantime the Association was informed by the Local Government Board that the West Sussex County Council proposals would not be sanctioned, and as the Association had thus won its case without being heard the matter was allowed to rest. This occurrence is very suggestive and evokes a rather terrible picture of what would happen to many of our main roads, were there no such association in existence to keep a check on local cheeseparers.

Nice Carnival at the Crystal Palace.

An appeal is being made for the loan of cars for June 1st and 2nd next, to take part in this charity show on behalf of the Royal Waterloo Hospital for Children and Women. The secretary is Mr. E. Douglas White, 19, South Molton Street, Bond Street, W.

REVIEWS OF BOOKS.

The Motor Year Book and Automobilist's Annual, 1906.

Edited by H. MASSAC BUIST.

(*London: Methuen and Co. Price 7s. 6d. net*).

THOSE who take in hand the Motor Year Book for 1906 will experience some suprise to find that the handy little book of a year ago has developed into a work of the size, comprehensiveness, and general utility of the present volume. It also has the great advantage of appearing in the spring time, when the motoring season is before us, and not in the late autumn, when it is merely a pleasant recollection. The term "year book" has become but too usually associated with a kind of combination of "desk companion" (which generally embodies a diary) and a series of ready reference tables. The 1906 Motorist's Year Book is nothing of the kind. It is really a treatise and summary of the automobile progress of the year 1905. Each chapter is complete in itself, and of these a large number give a succinct and, at the same time, comprehensive view of recent improvements and tendencies in motor car construction which, when the reader has fully digested and laid to heart, place him in a position to judge in the case of any car with which he may be confronted what features are really novel and up to date. It is no small triumph that this end has been accomplished, and accomplished well, without the aid of any illustrations, an unusual departure in a work of this kind. Not that the Motor Year Book is confined to this sort of thing. It deals with motor car law, has a chatty chapter on odds and ends connected with motoring, to which a number of the most popular writers on these topics have contributed, deals with races and touring, and, in fact, covers ably, lightly and well the great majority of subjects which are of interest to car owners and car makers, while, above all, everything is concise and compact. That the Motorist's Year Book for 1906 possesses these features to so much greater an extent than its predecessor, is a testimonial to the wisdom of the enterprising publishers, Messrs. Methuen, in securing as editor of the work Mr. H. Massac Buist, who is so well known and popular a writer on everything connected with automobilism. Mr. Buist has not only been the editor, but one of the leading contributors, and he has been assisted by a very able body of writers, including Lord Montagu, Sir John H. A. Macdonald, Bart., Mr. J. C. Inglis, and Mrs. E. Manville.

Bibliography of Road Making and Maintenance in Great Britain.

BY S. AND B. WEBB.

(*London: The Roads Improvement Association. Price 6d.*)

ENTHUSIASTIC members of the Roads Improvement Association, Members of Parliament, Parliamentary agents, and others specially interested in future legislation and re-organisation of the system of highways administration, will find this bibliography of road literature, the Highways and other allied Acts, and, in fact, everything connected with the subject of high roads, of the greatest use and value. It is, like all bibliographies, naturally designed to stand in the bibliography shelves of the library at the British Museum, and even numbers and press marks of books in the British Museum are given to facilitate reference and to save time (an excellent plan, though adopted by other British Museum bibliographies), and one that is very acceptable to all who have to "mug up" the subject. It is not possible to offer any criticism on the work, for to be able to do so one should have gone over the same ground as the authors, and that would take months, if not years. At the same time, one does not quite readily grasp why the principal books catalogued are arranged merely in chronological order. It is true that an index is added giving the names of authors, but this does not cover the long list of Parliamentary papers. The book would certainly be more complete and useful as a work of reference, if both the books and Parliamentary papers cited were arranged under subject matter headings as well as chronologically. In fact, the chronological arrangement might well take second place. In the case of modern works still in print, we really cannot see why the publisher's name and price, but certainly the former, should not be added. The absence of these particulars renders the book of less use to the general public than to the library student. That an immense amount of time and research has been involved in the compilation, however, is certain, and that it has received the benediction of the Roads Improvement Association is a tolerable guarantee that it is complete and trustworthy.

"The Happy Motorist."

BY FILSON YOUNG.

(*London: E. Grant Richards.*)

NEVER was there such a pæan sung, we will not say in praise of the motor car, but in praise of the delights of motoring as a pastime. Not that the automobile itself does not come in for its full share of recognition and appreciation. It does. But the aim and object of Mr. Filson Young's "Happy Motorist" is obviously to impress his readers with the charms of motoring as a pastime. Mr. Filson Young has a wonderfully facile pen, as is to be expected from a writer who has discussed a variety of problems, from the South African situation to the Irish question, and in addition wrote one of the most successful novels that appeared last year. But his pen, whatever its facility, is always informed by good, sound common sense, and even in his most elaborate and poetic descriptions of the joys of the road in the early morning, "with the dew on the grass and the light on the flower," there is always just that touch or suggestion of humour which takes off the effect of "fine writing," and adds to the charm of the whole. No book that has yet been written, probably not even "My Friend, the Chauffeur," is likely to make more converts to motoring. Both books, though otherwise so different, have this in common, that in neither does mere devotion to the automobile as a mechanical contrivance and a means of attaining speed along the road, shut out appreciation of the beauties of the world through which the automobilist passes. In fact, it is obviously Mr. Filson Young's intention, in the "Happy Motorist," to make devotees understand that to get the full enjoyment out of a car the car must be used as a means, and must never be the end. There are drivers—not a few, alas!—who speed along our loveliest roads in the darkest of goggles, and with their noses well down on the steering-wheel, recking not, and caring not, through what exquisiteness they pass, and it is just these people that ought to be compelled to read Mr. Filson Young's book. It is scarcely possible to put his attitude on the whole question better than he does himself:—

> "The motor car might," he says, "were it only used for the purpose, do a wonderful thing for its owners; it might, among other things, teach the English to know England as well as the Americans know it. Ancient, green England, threatened and disappearing beneath the tide of what is called progress, topping the flood still, and raising its old voice in these quiet country places! It is worth knowing, worth, to the class that can afford to explore it in this way, studying with knowledge and understanding, with patience, kindness, and sympathy."

—a point of view, which has often enough, if less eloquently, been enforced in the pages of THE AUTOMOTOR JOURNAL.

Over and above all this, however (and Mr. Young's eloquence is certainly such that anyone who can afford the luxury after reading his book, is morally certain to buy a motor car at the earliest possible moment), the work is full of practical hints specially intended for the convert which he is quite sure he will make. He deals with initial difficulties, the considerations involved in buying a car, and the various kinds of car that prospective motorists are likely to buy. On all these he gives sound and practical advice, and his chapters "About Driving," "Equipment," and "Preparing for the Road" will, if laid to heart by the beginner, save him endless trouble and annoyance. Other works have dealt with the scientific aspects of the motor car, others still, Mr. Filson Young's "Complete Motorist" among them, have been designed to instruct the commencing automobilist in the principles of car construction and operation, but this work is evidently designed to make the car popular with those who do not already know it, and more popular with those who do. The only previously successful attempts with which we are acquainted have been in novel form. Mr. Filson Young's work is as successful in this respect as any of them, rather more so, in fact, and it is not in novel or narrative form. To be able to accomplish a task like this is to possess literary faculty of the truest quality and in the highest degree.

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CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

THE LONDON ELECTROBUS COMPANY'S PROSPECTUS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As the manufacturer and patentee of the only electrical accumulator known in the electrical industry as the Oppermann Battery, I must disclaim any connection whatsoever with the recent statements made relating to a certain battery, in connection with the Electrobus Company, Limited, now before the public. Such statements are calculated to lead the public to believe that the Oppermann Battery mentioned in reference to that company is the Oppermann Battery manufactured and patented by me.

I am, Sir,
Yours truly,
April 23rd, 1906. CARL OPPERMANN.

Dealing with the same subject, the following letter has been sent round to the Press:—

SIR,—In the interests of motor traction, and investors in such undertakings, may I ask your insertion of the following criticism of the London Electrobus Company, now being most extensively advertised?

The promoters of this undertaking ask the public to pay them £20,000 cash down, half the net profits of the Company, after paying a dividend on the ordinary shares, annual orders for 50 'buses for seven years, a call on unplaced capital for eighteen months, and the nomination of two directors. As the 'buses would probably mean a profit of £100 on each, what the promoters are in effect asking is £20,000 down and £35,000 by annual payments of £5,000 a year. In return the public get the right to use a certain patent within a radius of 15 miles from Charing Cross for seven years!

Not a shred of evidence is adduced as to the value of this patent, of its staying power, or even of its being a master patent. The only attempt at expert evidence is a non-committal letter from a Mr. W. J. Crampton. Mr. Crampton may be a potential Edison, but we are sure he himself would be the last to claim the right to be acknowledged as in the front rank of electrical experts. Therefore, the promoters in effect ask the public to present them with £20,000 down and £5,000 per annum for seven years, and to trust to Providence for a return.

Secondly, I wish to call attention to the fact that the company can go to allotment on a subscription of £50,000. Out of the £50,000 the following payments have to be made:—

Cash purchase consideration	£20,000
Preliminary expenses	8,500
Underwriting expenses	2,500
Total	£31,000

There will thus be left only a balance of £19,000. Retaining £5,000 for working capital, the company will have £14,000 with which it can purchase 20 'buses. Assuming that fifteen of these would always be in work for six days a week, the following interesting result would be arrived at:—

	Per ann.
15 'buses earning £1 a day, equal to £90 per week ...	£4,680
Deduct—	
Salaries of six directors at £300, chairman £400	2,200
Depreciation, say ⅕ on 20 'buses per annum	2,800
Add salaries of office staff, rent, &c.	750
	£5.750

This shows a loss of over £1,000 for the first year's working, and this on the assumption that the 20 'buses are put on the roads on the day the Company goes to allotment. Obviously this cannot be, and equally obviously the Company cannot last. As the Company is underwritten, the wisest plan would be to make the underwriters take up the shares and report the result to the public after a year's working.

I am, &c.,
London, 24th April, 1906. H. S.

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COMMERCIAL POINTS.

AT the recent Austrian Motor Exhibition for Road Vehicles held in Vienna, we are informed, 246 wheels out of a total of 435 wheels were fitted with Continental tyres.

MESSRS. STRAKER AND MACCONNELL, LTD., inform us that they have acquired the whole of the premises at 44, Pall Mall, for the exhibition of their Italian pleasure cars—the "Bianchi" (chain driven), and the "Rapid" (cardan drive), and expect to complete the extensive alterations required in the course of the next two months. There will be accommodation for about 25 cars to be on show.

More "Clarkson" 'Buses for London.

CLARKSON, LIMITED, inform us that they have received orders for over 50 of their omnibuses for London, and have entered into contracts for three years with some of the largest London Companies for the regular supply of this type of motor omnibus.

ENGLISH solid rubber tyres are forging ahead abroad, and apparently "all British" make is in great favour. We hear that "Royal Sirdars" have received another large order for motor omnibus tyres from the Continent—from Belgium this time.

Dennis Bros., Ltd.

AT the annual general meeting of Dennis Bros., Ltd., Guildford, held on April 20th, a dividend of 12½ per cent. was paid to the shareholders and the amount of £4,500 placed to reserve.

The shareholders complimented the managing directors on the successful year's trading, and especially on the great progress made in commercial and public service vehicles.

In view of the considerable number of orders in hand and the extra facilities afforded by the new additional factory at Woodbridge Hill, the managing directors assured the shareholders that there was every prospect of a most successful year's trade in front of them.

AERONAUTICS.

Mr. Frank Hedges Butler in his balloon, "Dolce Far Niente" (45,000 ft. capacity), who ascended from Monmouth on Easter Monday, accompanied by Hon. C. S. Rolls, Professor Huntington, and Mr. John Holder. Standing up in the car of the balloon in the above photo are the Hon. C. S. Rolls, Mr. Frank Hedges Butler, and Professor Huntington, the three aeronauts chosen to represent England in the Gordon-Bennett Aeronautic Cup Race on September 30th. Mr. John Holder, one of the passengers who made the ascent, is also in the group, and Lord and Lady Llangattock are standing on the left and right respectively of the car.

An Assembly of Prominent Aeronauts.

THE third of a series of week-end balloon parties, organised by members of the Aero Club at their country houses, was held at Easter, when Lord Llangattock entertained at "The Hendre," near Monmouth, a number of amateur aeronauts, including his son, the Hon. C. S. Rolls; Professor Huntington, of King's College, London; Mr. Frank Butler, and Mr. J. A. Holder, of Birmingham.

Mr. Butler brought his balloon with him, and an ascent was made from Monmouth on Easter Monday, the balloon being in charge of the Hon. C. S. Rolls, with Professor Huntington, Mr. Holder, and Mr. Butler on board. The weather was bright and perfect, and a large concourse of people witnessed the departure of the balloon, which remained in sight for several hours; there was very little wind, and the balloon went first along the Wye Valley, of which a number of photographs were taken. At Symond's Yat it turned south, and remaining over the Forest of Dean for some two hours, it crossed the Severn twice near Newnham and eventually caught a light westerly wind, which enabled the aeronauts to land a few miles from Gloucester and return to "The Hendre" the same night.

MR. CHANUTE, who is usually regarded as the highest living authority on aeronautics, at any rate, on that department of the subject which deals with the conquest of the atmosphere by machines of the aeroplane type, has addressed an important letter to the *Scientific American*, which, as it so thoroughly establishes the *bona fide* character of the performances by the Wright Brothers, which THE AUTOMOTOR JOURNAL was the first to give to the British public, we make no apology for reproducing herewith. Mr. Chanute is not merely the leading authority on aeronautics, but he enjoys a reputation for integrity which places any statements to which he appends his name absolutely outside the pale of doubt. His letter is as follows:—

"Upon my return last evening from a ten days' trip to New Orleans I received your letter of 19th and telegram of 29th instant, asking me for a verification of the statement in the *Illustrirte Aeronautische Mitteilungen*, that I witnessed a flight of about half a kilometre by the aeroplane machine of the Wright Brothers.

"This is quite true. The Wright Brothers have for the past two years been in possession of a successful flying machine driven by a motor, to my certain knowledge, and have been gradually perfecting it.

"On the 15th of October, 1904, I witnessed a flight of 1,377 feet performed in $23\frac{3}{5}$ secs., starting from level ground and sweeping over about one-quarter of a circle, at a speed of thirty-nine miles per hour. The wind blew at some six miles per hour, but in a diagonal direction to the initial course. After the machine had gone some 500 feet and risen some 15 feet, a gust of wind struck under the right hand side and raised the apparatus to an oblique inclination of 15 degs. to 20 degs. The operator, who was Orville Wright, endeavoured to recover an even transverse keel, was unable to do so while turning to the left, and concluded to alight. This was done in flying before the wind, instead of square against it as usual, and the landing was made at a speed of forty-five to fifty miles an hour. One side of the machine struck the ground first; it slewed around and was broken, requiring about one week for repairs. The operator was in no wise hurt. This was flight No. 71 of that year (1904), and on the preceding day Wright Brothers had made three flights—one of 4,001 feet for less than a full circuit of the field, one of 4,903 feet covering a full circle, and one of 4,936 feet over rather more than a full circuit, alighting safely.

"The illness of a near relative, who had to be taken to the seashore, prevented me from being present at the greatly longer flights of September and October, 1905, but I visited Dayton in November, on my return, and verified the absolute accuracy of the statements which the Wrights have since made, over their own signatures, to the Aérophile of Paris and to the Aero Club of New York. There is no question in my mind about the fact that they have solved the problem of man-flight by dynamic means.

"Believing that this solution had a money value, they have, until recently, preserved whatever secrecy they could, particularly when those who chanced to learn of their experiments made inquiries as to the construction and details of their apparatus; but since the French papers have published that negotiations were pending for the use of their machine, they have given some particulars of their performances. As the first use will be in war, it is my belief that the various purchasers will desire to preserve such secrecy as may be practicable concerning the further developments.

"In addition to the great feat of inventing a practical flying-machine, the Wright Brothers have, in my judgment, performed another improbable feat by keeping knowledge of the construction of a machine, which can only be operated in the open, from the incredulous but Argus-eyed American Press."

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The Turning Circle of a 6-Cylinder Car.

As the outcome of a wager, a test was made with a standard 6-cylinder Rolls-Royce car on Tuesday last, to determine whether it could turn in a certain portion of Victoria Street that is about forty feet wide. In the result, it proved easily capable of so doing, there being eight feet of space to spare.

RACES, RECORDS, AND TRIALS.

THE TARGA FLORIO RACE IN SICILY, MAY 6.—Through the mountainous portion of the course. View near Petralia-Soprano. Note the cross at the summit of the mount. Monuments of a similar character are scattered throughout the island.

Welbeck Car Trials.

A SERIES of races for members will be held on the Welbeck Track, under the auspices of the Nottinghamshire A.C., and by permission of His Grace the Duke of Portland, on May 5th next, commencing at 2 p.m. The programme will include the following events :—

1. *Flying Kilometre.*—Handicap, limited to standard touring cars. 1st prize.—Wilson Challenge Cup and Gold Medal.
2. *Scratch Event.*—Fastest time Flying Kilometre. Prize.—Gold Medal.
3. *Speed Judging Competition.*—Members will drive their cars over the flying kilometre, and immediately after crossing the finishing line, hand in, in writing, their estimate of the speed in m.p.h. at which they covered the kilometre—an official observer to be carried on each car. Winner—the competitor who most correctly estimates speed. Prize.—Gold Medal.
4. *Speed Judging Competition.*—Open to visitors and non-automobilists. Speed of car being driven down the course to be estimated. 1st prize.—£1 1*s.* ; 2nd. 10*s.* 6*d.*

Scottish Reliability Trial.

THE following further entries have been received :—

34.	Enfield Auto-Car Co.	20–30-h.p. Enfield.
35.	Euston Motor Co.	18–24-h.p. Courier.
36.	London Motor Garage Co.	28-h.p. Double Phaeton "Pipe."
37.	J. W. Stocks	15-h.p. De Dion.
38.	D. McKay Drummond	20–24-h.p. North British.
39.	Mrs. C. S. F. Loder	20–30-h.p. Pilain.
40.	Bergius Car and Engine Co.	16-h.p. Kelvin.

Odotachymetre Trial.

ELEVEN devices, including two by the Cowey Engineering Company, have been entered for this French competition, which commences on May 9. The road tests will be on the Montgeron—Ozouer la Ferrière road.

Fromes Hill Climb.

THE following have either entered cars for this event or have intimated their intention of doing so :—

Adams Mnfg. Company (Adams-Hewitt)
Ariel Motor Co.
P. Brodtmann
Brooks
Duryea Company (Duryea)
J. Eastmead (Sunbeam)
C. Edge (Napier)
C. J. Harman and Co.
J. C. Holder (Daimler)
L. Jefferson (Rover)
Legros and Knowles (Iris)
Mapplebeck, Stuart and Co.
Capt. T. Masui
Metallurgique Company.
F. W. Peckham Motor Syn.
T. C. Pullinger (Humber)
C. S. Rolls and Co. (Rolls-Royce)
Seymours, Limited
Vauxhall Engineering Co.
T. H. Woollen (Clement-Talbot)

Hesitating entrants are asked by the secretary to send their entries as early as possible.

The lunch and dinner tickets, which are now ready, may be obtained from Mr. Wilfrid Groom, the hon. sec., who states it will be a great convenience if those requiring lunch or dinner will apply early, so that arrangements as to number may be made.

1906 Tourist Trophy Cars.

ALREADY the two new Rolls-Royce cars, which have been built for this year's race in the Isle of Man, are on the road, and we learn that Mr. P. C. Northey has made some thoroughly satisfactory trials with the vehicle which he is to drive in this important event. That car is geared to 15 m.p h. on the first speed, and 50 m.p.h. on the top speed—with the engine running at 1,000 revs. per minute—and it has shown itself capable of carrying its full load up hills of one in five, and even one in four, as well as being able to creep along on the top gear at less than 12 m.p.h. on the level. The other car, which will be driven by the Hon. C. S. Rolls, is being tested on the road by Mr. Royce. On the "direct-drive," which is equivalent to 36 m.p.h. at 1,000 r.p.m., the ascent of Dashwood Hill has been accomplished.

The Milan "Coupe d'Or."

The list of engagements for the Milan Coupe d'Or, which promises to be one of the most important of the Continental events of the year, includes over 40 cars. In the first category Napier, Argyll and Daimler cars will represent Great Britain, and a White steam car may possibly compete on behalf of America. Italy is very strongly represented, including 3 Fiats, 5 Isotta and Fraschinis, 3 Züsts, 1 Bianchi, 3 Italas, 5 Rapids, 2 Florentias, &c. France is in the list with 3 De Dions. In both the second and third categories an Oldsmobile car figures.

This event is remarkable in many ways, primarily from the fact that it is organised by the Milan Automobile Club entirely on its own responsibility. A magnificent list of prizes is offered, totalling at present to 120,000 francs, in addition to a series of works of art, of which the premier is the "Coupe d'Or." Each winner, however, in addition to winning a cup, in many cases will also receive very substantial cash prizes, ranging from 25,000 francs downwards, and besides special prizes, which have been presented by the King of Italy and leading municipalities, a large amount of cash has been allotted for prizes by different commercial firms, such as the makers of Michelin tyres, Gaulois tyres, Samson antiskids, the Darracq Company (for the first Darracq car), Gladiator (for the first Gladiator car), Bianchi (for the first Bianchi car), &c.

The race, which is for tourist cars, will serve as a remarkable commentary on the marvellous advance which the Italian motor industry has made within the last two years. The trial itself, as was announced in The Automotor Journal some long time ago, is over a distance of 4,003 kilometres, through some of the most mountainous districts in Italy. We give a profile of the selected route in our current issue, from which the severe nature of the entire contest may be roughly gathered, whilst the daily stages and distances, and the chief points traversed, are clearly indicated from beginning to end. The rules of the trial provide for its taking place from May 15th to 25th, the cars originally being divided into three categories, viz. :—

Category 1.—Cars of which the cost of the chassis is over 8,001 francs, and in which the body portion weighs at least 300 kilogs., and provides for four seats, of which two must be occupied. Entry fee 2,000 lire.

Category 2.—Light cars of which the chassis costs 4,001 francs to 8,001 francs, and in which the carriage body must weigh at least 150 kilogs., and provide for four seats, two of which must be occupied. Entry fee 750 lire.

Category 3.—Voiturettes costing complete with carriage body less than 4,001 francs, with seating capacity for two, of which one seat only need be occupied. Entry fee 500 lire.

Entries closed on April 1st, and a 5 per cent. surcharge was made from April 1st to 20th. By the rules, makers might enter teams of three cars, designated beforehand, at an inclusive entrance fee of 5,000 lire. The 11 stages of the trial must be covered by all cars entered in Category 1, and stages 1 to 10 by cars entered in Categories 2 and 3. The classing will be upon the average speed for each stage during the daily journeys, as follows :—

Category 1 : minimum speed 30, maximum 40 kil. per hour. Category 2 : 25 and 35 kil. Category 3 : 20 and 35 kil.

The average speeds will be calculated according to the hour of starting and arriving for each stage. Arrival before the minimum time allowed will entail double penalisation, and time occupied beyond the maximum allowed will also be penalised. Any car arriving 15 minutes in advance of the minimum time will be disqualified. In each category the winner will be the car which throughout the entire trial has kept the nearest to the average maximum speed fixed for each category. In the event of there being two or more ties, the vehicle in which the chassis is the least costly will have the premier place. Very few cars, however, have been entered, other than in the heavy class. The organising club has therefore decided to bring into force the rule which empower it to "suppress" categories, where the number of entrants does not justify their being retained. Cat. 2 and 3 have therefore been cancelled accordingly.

Closed "parcs" will be enforced during all stoppages, and the vehicles will be strictly "controlled" during the run.

Hill Climb at Lyons.

For the second year, on April 22nd, a contest took place, in fine weather, over a distance of 4 kiloms. on the Chères-Limonest road, the event being under the auspices of Rhone A.C. Forty-three vehicles took part, the best time established being 2 mins. $28\frac{1}{5}$ secs. by Colomb, on a 100-h.p. Mors car. The chief results were as follows :—

TOURIST CARS.

Cat. I. Chassis under 4,000 *francs.*—Sizaire-Naudin, 7 mins. $52\frac{3}{5}$ secs.

Cat. III. Chassis 6,001 *to* 9,000 *francs.*—1. Motobloc, 6 mins. $12\frac{3}{5}$ secs. : 2. Darracq, 8 mins. $2\frac{1}{5}$ secs. ; 3. Darracq, 8 mins. $17\frac{4}{5}$ secs.

Cat. IV. 9,001 *to* 13,000 *francs.*—1. Mieusset, 5 mins. $0\frac{3}{5}$ sec. ; 2. Buire, 5 mins. $36\frac{3}{5}$ secs. ; 3. Mieusset, 5 mins. $46\frac{3}{5}$ secs.

Cat. V. 13,001 *to* 18,000 *francs.*—1. Mieusset, 4 mins. $10\frac{1}{5}$ secs. ; 2. Mieusset, 4 mins. $21\frac{3}{5}$ secs. ; 3. Cottin, 4 mins. $35\frac{1}{5}$ secs.

Cat. VI. 18,001 *to* 24,000 *francs.*—1. Buire, 3 mins. $58\frac{1}{5}$ secs. ; 2. Buire, 4 mins. $54\frac{3}{5}$ secs.

Cat. VII. over 24,000 *francs.*—1. Rochet-Schneider, 3 mins. $4\frac{4}{5}$ secs. ; 2. Rochet-Schneider, 3 mins. 9 secs.

Electric Vehicles.—1. Dinin, 16 mins. $29\frac{1}{5}$ secs.

In addition, the cars were classed under a special "efficiency of chassis" category, divided into classes according to motor power. The results were arrived at under the following formula —

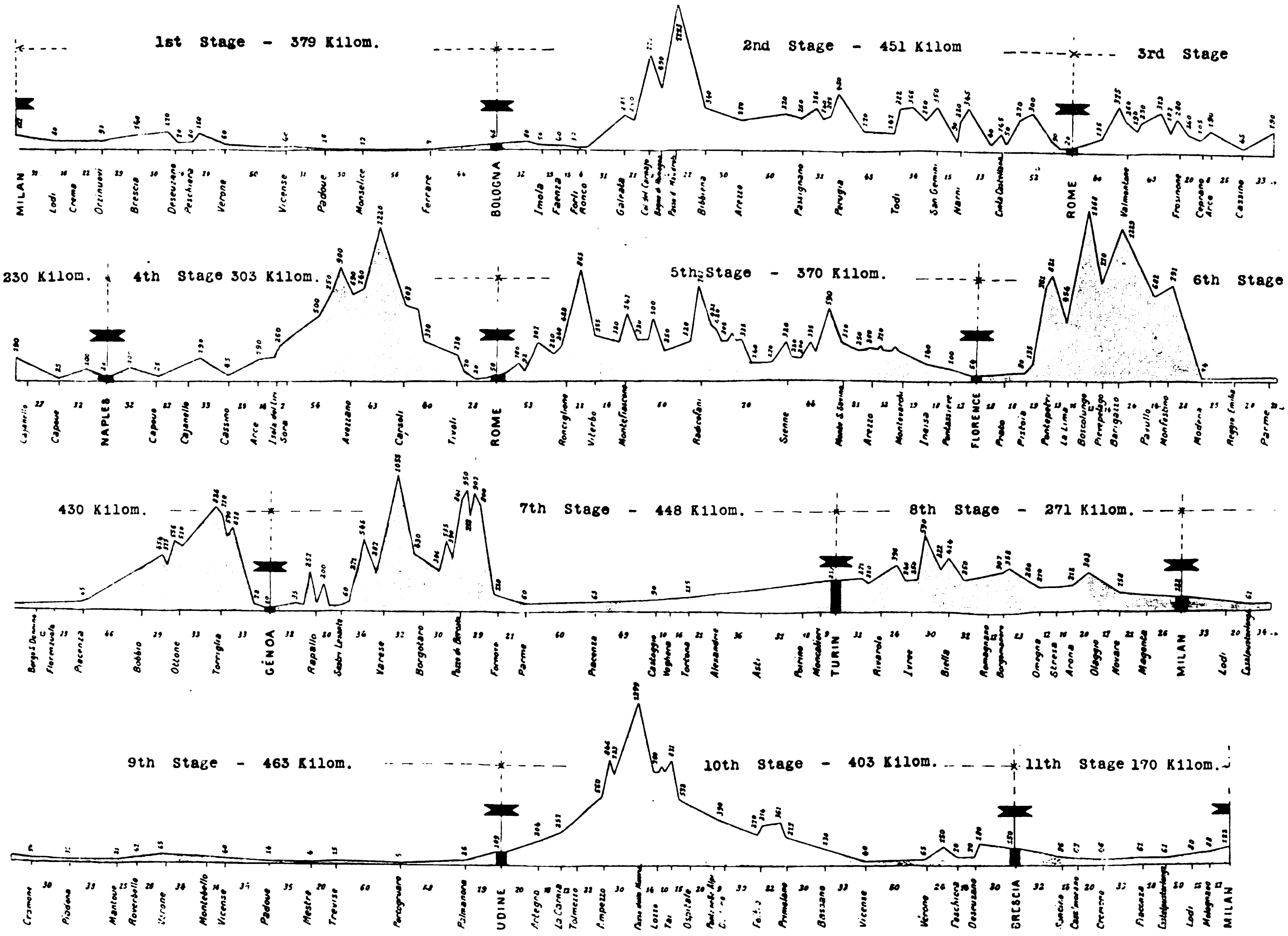
$\frac{PV}{S}$ in which P = weight ; V = speed ; and S = piston area.

Class 1. *Piston Area under* 320 C^2.—1. 10-h.p. Motobloc, 5 mins. $23\frac{1}{5}$ secs. ; 2. 14-h.p. Renault, 5 mins. 15 secs. ; 3. 16-h.p. Buire, 4 mins. 55 secs. (Best time, 18-h.p. Luc-Court car, 4 mins. 48 secs.).

Class 2. *Piston Area* 321 *to* 460 C^2.—1. 24-h.p. Mors, 5 mins. $10\frac{3}{5}$ secs. ; 2. 25-h.p. Buire, 4 mins. $31\frac{4}{5}$ secs. ; 3. 35-h.p. Mercedes, 4 mins. $1\frac{4}{5}$ secs. (Best time, 24-h.p. Cottin, 3 mins. $58\frac{1}{5}$ secs.).

Class 3. *Piston Area* 461 *to* 620 C^2.—1. 35-h.p. Buire, 4 mins. $18\frac{3}{5}$ secs. ; 2. 35-h.p. Mieusset, 4 mins. 43 secs. ; 3. 35-h.p. Buire, 4 mins. $1\frac{1}{5}$ secs (best time).

Class 4. *Piston Area over* 620 C^2.—1. 70-h.p. Mors, 2 mins. $46\frac{4}{5}$ secs. ; 2. 120-h.p. Mors, 2 mins. $28\frac{1}{5}$ secs. (best time) ; 3. 120-h.p. Rochet-Schneider, 2 mins. 41 secs.



Profile of the course for the Reliability Trial organised in Italy by the Milan Automobile Club, in which the chief prize is the "Coupe d'Or."—Our contour, which is based upon that of "La France Automobile," clearly shows the relative heights of the mountains which will have to be climbed in the course of the week's runs, whilst the distances between the leading towns and villages en route are given in kilometres, each daily journey being also clearly denoted.

Circuit Européen.

IN spite of all the booming, the A.C. de France's big European contest has undoubtedly fallen much flatter than those responsible ever conceived possible. A limit to numbers was to be enforced, but there does not appear a likelihood of this proviso being called into action. As we stated last week, the entries were coming in but slowly, and when the lists were announced to close, at single fees (April 20th), under fifty cars in all had been officially registered. Consultation, by telegraph, between the various clubs interested was resorted to, and by Saturday last it had been decided to let the entry list remain open, at single fees, for one month longer, viz., May 20th, a course which, although no doubt very desirable from the point of view of the organisers, is hardly fair to those manufacturers who have taken their chances and entered the cars to time, in accordance with the regulations. This form of procedure, however, is so in keeping with the usual Continental custom that the decision is not likely to cause much heartburning, as the extension of the date was almost a foregone conclusion. The newcomers, bringing the total entries up to fifty are, a Borderel car, 4 Benz, 1 Pilain, 3 British-built Daimler cars, and 1 Scrive, a Pierce Arrow (America), Pilain II, De Dion-Bouton, Krieger, Wolseley II, Martin-Lethimonnier, Benz V, Metallurgique, Alcyon, Delahaye I and II, Itala, Saventhein I and II, De Dion-Bouton V, VI, VII and VIII.

Targa Florio.

IF not postponed, the Targa Florio race in Sicily will be a thing of the past on Monday week. Although many concessions have been made to induce entries, the list is so far not a very extensive one, Italy being the mainstay of the event. The picturesqueness of the island scenery should be a factor in helping the event to a successful issue. This week we add a few more pictures of the course to the very beautiful series of photographs which were published in THE AUTO-MOTOR JOURNAL on March 17th.

Herkomer Cup.—June 6–13.

AT the close of the entry list, at single fees, for this contest in June, no less than 146 cars had been inscribed. It is devoutly to be hoped they will not all start, or we are afraid the organisers will have more on their hands than they can very well regulate. Unlike last year, when only three British entrants figured in the list—to wit, three Daimlers, quite a number of names are down to represent this country. These include, besides Mrs. E. Manville, who created such a furore last year by her driving, Lord Montagu of Beaulieu, Messrs. Charles Jarrott, Arthur Birtwistle, Frank Rendle, Philip Dawson, Robert Stotesbury, D. H. Morgan, Charles Hardy, W. Herdmann Ash, A. D. Grigg and E. J. Robertson Grant.

Some notable foreign entrants are Prince Henry of Prussia, Edgar Ladenburg, who was so successful in 1905, the three Italian cracks, Lancia, Nazarri and Ricorde, Baron Adrien de Türckheim, Baron De Dietrich, Herzog von Arenberg, Willy Pöge, Graf Wilhelm von Arco, Fritz and Heinrich Opel, Dr. Ludwig Opel, Willy Tischbein, and, representing America, Percy P. Pierce.

Vanderbilt Cup Race, 1906.

FOR this race Messrs. A. Darracq and Company are desirous of running two of their cars to represent France. The A.C. de France, however, have already disowned the Cup, which was secured last year by a French car, and have announced that they will not take any further part in the contest, as the rules being based practically upon those of the Gordon Bennett Race do not give France the preponderating representation to which the French Club considers she is entitled. The question now arises is what will be done to get over the difficulty? Some French makers do not approve of the decision of the A.C.F., as it will be seen, and are willing and anxious to fight, and if possible again secure the trophy. Probably the American authorities will cut the knot by accepting approved entries direct from manufacturers, under the circumstances, instead of only through the A.C.F. as the representative club.

Circuit des Ardennes.

FOUR Panhard and Levassor racers have been entered for this Belgian race taking place on August 13.

Resilient Wheel Trial.—Paris—Nice—Paris.

THIS contest, which started—as we announced last week—on April 17th, was to conclude on Thursday of this week. The following ten devices started:—Class I., sect. 1, Yberty and Merigoux, Ducasble, Securitas; Class I., sect. 2, Hallé, Soleil, Cadignan; Class II., Hallé, "E. L.," Garchey; Extra Class, Mounin Damidot. During the first half of the journey, the "E. L.," Garchey, Soleil, and Ducasble, appear to have been the most successful, and they were the only devices reported as still running when the vehicles reached Nice. We hope to publish the official results next week.

M. Tamagni and M. Raggio in the Marchand light car, which secured so great a success in the Milan-San Remo trials recently held. This car scored the best time and won the Marsaglia Cup for the standing kilometre.

MOTOR CYCLING.

Motor Cycle Open Hill-Climb.

An open hill-climb was carried out by the Hertfordshire County Automobile Club on Saturday last. Maple Hill, the scene of the meet, is a short stiff rise between Boxmoor and Chesham. Twenty-nine entries were received, and twenty-three competitors satisfactorily completed the course. Subject to confirmation of the Sports Committee, the following are the chief times of the climb. The results on the club formula will be issued in a few days :—

Machine.	H.P.	Cylinders.	Bore and Stroke.	Time. m.	Time. s.
Class A.—*Cylinder Capacity not more than* 76 × 76 *mm.*					
Eland-Minerva	2¾	One	76 × 76	0	34⅕
Godfrey-Minerva	2	One	66 × 72	0	44
Phœnix-Cob ...	2¾	One	76 × 76	1	11
Class B.—*Cylinder Capacity not more than* 85 × 85 *mm.*					
Brown	3½	One	82 × 88	0	29⅕
Quadrant ...	3½	One	81 × 88	0	30⅘
Werner	4	Two	60 × 76	0	32⅘
Class C.—*Motor Bicycles of any Cylinder Capacity.*					
Vindec	5	Two	75 × 76	0	29⅗
Quadrant .	3½	One	81 × 88	0	31⅕
Werner	4	Two	60 × 76	0	32
Class D.—*Passenger Machines of any Cylinder Capacity.*					
J.A.P.	6	Two	70 × 95	0	50⅖
Riley	9	Two	86 × 89	0	59⅗
Phœnix	7	Two	75 × 80	1	4⅕

Portmarnock Speed Trials.

The first of the season's speed trials under the auspices of the Dublin centre of the Motor Cycle Union of Ireland took place on Saturday last. As in previous years the venue was Portmarnock, and the card was made up of three events. The weather was not all that could be desired, and the threatening aspect in the early hours of the day had an effect on the number of competitors and spectators, which was not up to the standard of past reunions.

The mile novice was won by H. Quinn, who was also first home in the ten miles, but being disqualified for pedalling beyond the 50 yards mark at the end of the first mile was debarred from adding a second winning bracket to his name at the opening of the season. The various events were well contested. The following are the details :—

One Mile Novice Handicap.

1. H. Quinn (3-h.p. Triumph, 50 secs.), 1 min. 45 secs.
2. F. Gill (2-h.p. Minerva, 45 secs.) 1 min. 48⅕ secs.

Won by 15 yards.

One Mile Handicap (open to members of the Union; machines unlimited as to h.p.).

1. C. G. Lewis (20 secs.), 2 mins. 2⅗ secs.
2. S. Black (35 secs.), 2 mins. 3⅕ secs.
3. A. J. Kettle (10 secs.), 2 mins. 3⅘ secs.

Won by 5 yards, a good third.

Ten Miles Handicap.

(Handicap framed from C. B. Franklin (2¾-h.p. F.N.) as on scratch).

1. C. G. H. Lewis (2¾-h.p. F.N., 1 min. 30 secs.), 19 mins. 40 secs.
2. R. Howison (2¾-h.p. F.N., 3 mins. 30 secs.), 23 mins.

S. Black (2¼-h.p. Buchet, 4 mins.).
W. Jacques (3¼-h.p. Alcyon, 2 mins.).
C. Kavanagh (2½-h.p. Morehampton, 2 mins. 30 secs.).
A. J. Kettle (3½-h.p. Peugeot, scratch).
H. Quinn (3-h.p. Triumph, 5 mins.), disqualified for pedalling beyond the mark.

CLUBS AND ASSOCIATIONS.

A.C.G.B.I.

Examinations for the club's driving and mechanical proficiency certificates have recently been held in Reading, Cardiff, Cheltenham, Shrewsbury, Market Harborough, and Chester; also in Dublin, Cork, Waterford, Belfast and Dundalk.

These examinations were well attended by both owners of motor cars and their drivers. Amongst owners who qualified for driving certificates were :—Sir Bache Cunard, Earl of Norbury, Sir Horace Plunkett, Dr. S. H. Law, Major C. H. Wellesley, Capt. A. W. Tufnell, Messrs. G. Cunard, F. Gough, S. N. Bankart, F. B. Coppell, A. J. Wallace, W. H. Livingstone, W. Fitzgerald, G. Statham, R. H. Wandersford, W. Pope, G. Mackesy, H. T. Bigger, J. S. Myles, F. M. Heyn, I. Tate, S. B. Smyth.

Blackheath A.C.

The opening run of the season takes place to-day (Saturday) to "The Beacon," Westerham Hill, Kent, where tea will be provided at 5 o'clock.

The following further fixtures have been arranged by the committee for the current year :—

May 19.—Run to Westerham.
,, 26.—Motor Union Meet, Birmingham.
June 16.—Hill Climb, Tea at "Sir J. Amhurst" Hotel, Seal.
,, 30.—Cricket Match.
July 7.—Mrs. Firth's "At Home," Gravesend.
,, 14.—Speed Gauging and Picnic, Holwood Park.
,, 21.—Motor Union Meet, Bath.
,, 28.—Gymkhana.
Sept. 22.—Motor Union Meet, York.
Oct. 6.—Final Run to "The Beacon," Westerham Hill, Kent. Tea and Impromptu Concert.

British Motor Boat Club.

The opening meeting and dinner of the season of the British Motor Boat Club, on Saturday, May 5th, at Nuthall's, Kingston-on-Thames, shows signs of being a very successful function.

Amongst the guests who will accompany the commodore (Admiral Sir William Kennedy) and the vice-commodore (Marquis of Ailsa) are :—Sir Evan Macgregor (Secretary to the Admiralty), Lady Macgregor, Miss Eva Macgregor, Miss Alice Kennedy, Capt. and Lady Mabel King-Hall, and Mr. J. R. Heaven.

The start for the cruise in company on the river will be made at 4 p.m., returning in time for dinner in the Rosebery Hall at Nuthall's at 7 p.m.

Kensington Automobile Club.

Representation has been made to the Motor Union that it is desirable that a district club should be formed for automobilists in Kensington under the title of the "Kensington Automobile Club." At an informal meeting of a few automobilists, a provisional committee was constituted, consisting of Dr. W. Spencer Cox, Dr. L. C. Dobson, Messrs. W. H. Thompson, W. M. Forster, L. A. Bidwell, E. F. Philtrick, and J. Horace Reeves (secretary pro tem.).

British Automobile Manufacturers in America.—The New York headquarters of the English Daimler Company.

A general meeting of Kensington automobilists was convened for Thursday of this week at the Palace Hotel, High Street, Kensington, for the purpose of formally founding a club, adopting rules, and electing a representative committee. Mr. J. Horace Reeves, of 6, Penywern Road, Earl's Court, S.W., is acting as hon. sec. (pro tem.).

Marine Motor Association.

THE question of the measurement of boats for rating having been discussed at length by the Council, and the official measurer having submitted that, owing to the great increase in the number of applications for certificates, the present single-handed arrangement will shortly become impracticable, it has been decided to appoint Mr. J. A. Smith, the present measurer, to the office of Registrar of Ratings, and to appoint local sub-measurers in various districts.

With regard to the new rules for the registration of boats by the Association, a distinguishing number flag is to be adopted for un-rated boats.

North London A.C.

THE second run of the season will take place on Saturday, May 5th, to "The George Hotel," Harpenden, where the first of the series of club competitions arranged for these outings will be held. Members should assemble at the headquarters, "Fox Hotel," Palmer's Green, at 3 p.m. sharp.

Nottinghamshire A.C.

A COMMITTEE of the Nottinghamshire Club, owing to complaints received from members, have taken into serious consideration the nuisance caused by dust, and although this nuisance cannot be prevented by automobilists, it might, they consider, be minimised to a certain extent. The committee is unanimous in endeavouring to do all in their power to prevent complaints, and they have accordingly passed the following resolution :—

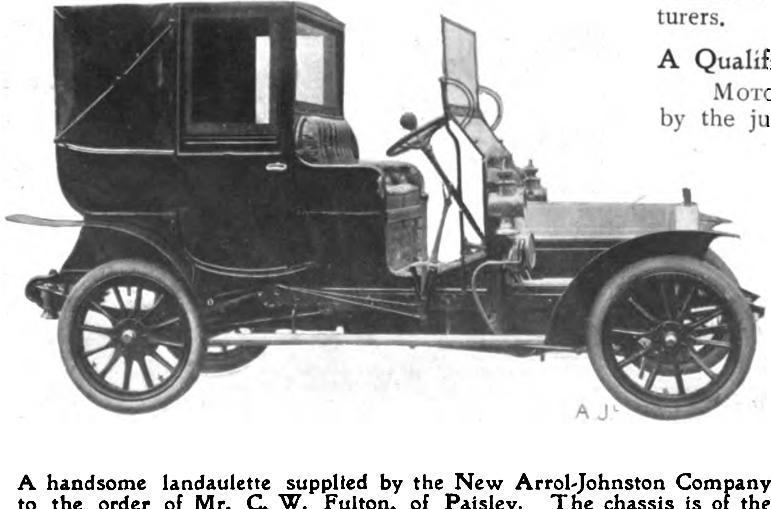
"In consequence of the nuisance caused to the general public by dust, no club runs shall henceforth be organised by this club except in respect of private invitations."

The club runs already organised for 1906 are, therefore, cancelled.

Society of Motor Manufacturers and Traders.

APPLICATIONS for the first ballot for places at the November Olympia Exhibition closed on Friday of last week. Those not signing the bond have still up to the end of May in which to apply for space, but the increase in the number of applications by bond signers has, we learn, been enormous, so that in spite of the exclusion of commercial vehicles and boats, it is now certain that every inch of the building will be completely applied for.

The Commercial Vehicle Committee of the Society have settled some of the arrangements in connection with the April, 1907, Commercial Vehicle Show, one particular point of which will be that space will be provided in the main hall for a class of exhibit which has hitherto received but little attention, viz., machinery used in automobile construction. As at this Exhibition the marine motor section expects to fill the whole of the annexe, there is every probability that only those who apply well in time will be able to obtain adequate space at this Show.



A handsome landaulette supplied by the New Arrol-Johnston Company to the order of Mr. C. W. Fulton, of Paisley. The chassis is of the 12-15-h.p. type, similar to that which won the Tourist Trophy Race last year, and was described in full detail by us in our issues of November 18th to December 23rd, last.

MOTOR BOATING.

Nice—Toulon—Cannes—Nice.

FOLLOWING the Monaco motor boat meeting, after two postponements owing to the bad weather, the race on the Riviera between the above points took place last week. The results for the 340 kiloms. were as follow, there being only one boat in each class. "Calypso" had an accident, and abandoned the race :—

	Nice-Toulon.	Toulon-Cannes.	Cannes-Nice.	Total.
Racer.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
Mercedes W. N.	4 58 54	4 12 34	1 2 13	10 13 41
Cruisers.				
Quand Même (over 18m.) ...	6 49 51	5 33 54	1 13 40	13 37 5
Consuelo (over 12m.) ...	7 9 54	5 51 15	1 20 49	14 21 58
Féfé (over 8m.)	6 42 51	6 21 49	1 13 33	14 18 13
Saint Jean (Auxy. Yacht) ...	—	—	—	22 0 49

Monaco Meeting.

THE "race" which took place by way of a trial under the new French motor boat rules, is announced to have resulted as follows:—1. Féfé II, 1h. 3m. 25s.; 2. Dalifol, 1h. 30m. 1s.

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Speed Mania and Insurance.

THE few objectionable motorists who systematically scorn the speed limit will learn with interest and possibly some trepidation that an American Insurance Company has refused to compensate a motorist in the case of an accident which occurred when he was travelling at a high rate of speed, on the ground that he had become insane from speedomania.

Inaugural Ceremony at the "Austin" Works.

AN inaugural lunch was arranged for Thursday of this week at the works of the Austin Motor Company near Birmingham, when a large number of guests accepted the invitation to view the factory on the occasion of the completion of the first "Austin" car. We therefore hope to be in a position to give some valuable information next week concerning the productions of this important new British firm of manufacturers.

A Qualified Verdict.

MOTORISTS will mostly agree that the rider added by the jury to their verdict of accidental death in the case of the coroner's inquest on William Shipway was scarcely called for. Shipway was knocked over with his cab by an "Arrow" motor 'bus in Regent Street recently, and died from the injuries he received. The 'bus, which was apparently proceeding at a moderate speed, skidded, and the rear portion struck the cab, producing the tragic result mentioned. The jury found a verdict of "accidental death," but added that the driver did not use due "discretion." There did not appear to be any suggestion, however, by the jury, the coroner, or anyone else, as to what the driver did that he ought not to have done, or what he left undone that he ought to have done.

An "Iris" shooting brake just constructed by Messrs. Legros and Knowles for use in Cornwall. The body is very wide and roomy with seating capacity for eight people in the back and two on the front seats, provision being made for carrying luggage when required up to 30 cwt. The motor is a 24-h.p. and the vehicle throughout is very strongly built, as it is required to be used over the moors where roads are practically unknown.

Hastings Motor 'Buses.

It has been arranged to re-start this service of motor 'buses, which last year were "scared" away by the electric trams.

Baron Pierre de Crawhez.

King Leopold has created Baron de Crawhez a Chevalier of the Order of Leopold of Belgium. The Baron, an enthusiastic automobilist, was the originator of the Ardennes Circuit race.

The Late Mr. J. W. Adams.

It is with much regret we learn of the death last week of Mr. J. W. Adams, who has made himself so popular in association—since his boyhood—with the Humber Company. Only quite recently we announced the commencement of a journey by Mr. Adams round the world, undertaken partly for rest and partly for business. He only succeeded in reaching Bombay, however, whence he was ordered home again by the doctors, only to succumb to his illness, as already stated, at Beeston. Mr. Adams will not only be mourned by his widow and children, but will be sadly missed by all those in the Humber Company who have for so long possessed in him both a friend and a fellow-worker of the greatest capacity.

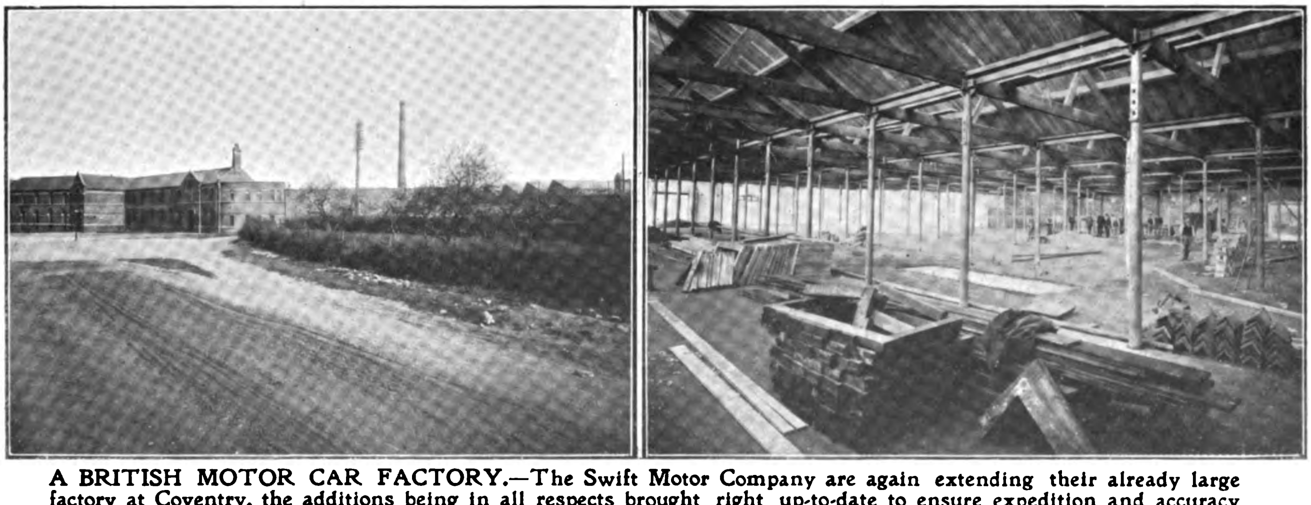
His Majesty's Mail Held Up by a Motor Car.

Mr. J. N. Ward, who is the owner of a 90-h.p. Panhard, was being driven from London to Newcastle recently when at a certain level crossing it became unmanageable, lost its way through the gates at a level crossing, and became fixed in a ditch. The result was that the London mail had to be stopped, owing to the accident. "Motor Pirates" please note!

What is "Danger to the Public?"

A successful appeal from a decision of the Guildford magistrates was made to the Quarter Sessions sitting at Guildford recently, under the Presidency of the Recorder, Mr. George Cave, K.C. Mr. William Philpott, chauffeur to Mr. Cowley Lambert, whilst driving in Guildford, had collided with a Bath chair owing to an error of judgment. The Bench inflicted a small fine, from which the appeal was made. The Recorder stated that he did not think that a mere error of judgment, when all reasonable care was used, constituted driving to the danger of the public, and he accordingly allowed the appeal.

His Grace the Duke of Westminster's Hotchkiss Car.



A BRITISH MOTOR CAR FACTORY.—The Swift Motor Company are again extending their already large factory at Coventry, the additions being in all respects brought right up-to-date to ensure expedition and accuracy in turning out cars. Our photographs give a general view of the factory and show a section of the new workshops in course of construction.

NEW COMPANIES REGISTERED.

Amalgamated Motor 'Bus Co. (Ltd.).—Capital, £200,000 in £1 shares (100,000 preference). Chief object, to adopt agreements with C. W. French, the London Omnibus Carriage Company, Ltd., and the British Automobile Development Company, Ltd., and to carry on business in keeping with the title. First directors, C. W. French, W. H. Hills, and J. M. Fells.

Carey Brothers (Limited).—Capital, £5,000 (£1). Object, to acquire the business of manufacturers of and dealers in cycles, motors, &c., carried on by E. J. Carey and W. J. Carey as Carey Brothers. First directors, E. J. Carey and W. J. Carey.

Robert F. Cherry (Ltd.), Queensgate Road, Beverley, Yorkshire.—Capital, £2,000 in £1 shares. Object, to acquire the business of a cycle and motor engineer carried on by R. F. Cherry, at Beverley, Yorkshire, as Robert F. Cherry and Sons.

Crossley Motors (Ltd.).—Capital £100, in £1 shares.

English Mercedes Motor Co. (Ltd.)—Capital £100 in £1 shares.

Glasgow and Paris Motor Garage and Repairing Co. (Ltd.).—Capital £5,000, in £1 shares.

Lawden Foundry Company (Limited), 120, Alcester Road, Moseley, Birmingham.—Capital, £5,000 (£1) (2,000 preference). Object, to acquire the Lawden Foundry, carried on at 37, Lawden Road, Bordesley, Birmingham, by Motor Plants, Limited.

London Electrobus Co. (Ltd.), 17, Cockspur Street, Pall Mall, S.W.—Capital, £100 in £1 shares. Object, to adopt an agreement with the International Motor Traffic Syndicate, Ltd., for the acquisition of certain options, contracts, and properties, &c. Directors' borrowing powers restricted to £100,000 without sanction of general meeting. Directors qualification, £100. Remuneration of chairman, £400 per annum; of other directors, £300 per annum.

London Motor Finance Syndicate, Ltd., 2, Coleman Street, E.C.—Capital £1,000, in £1 shares.

Norfolk Motor Touring Company (Limited), 6, Queen Street, Norwich.—Capital, £1,500 in £1 shares. Object, to carry on at Great Yarmouth or elsewhere the business of owners of and dealers in automobiles. First directors, H. R. Everitt and E. J. Bullard.

Penny Motor 'Bus Co. (Ltd.).—Capital, £100 in £1 shares.

W. H. Stansbury and Co. (Limited)—Capital, £20,000 in £1 shares. Objects, to acquire the business of tar paviors, manufacturers of improved tar macadam and other materials for road construction, &c., public and private street works, &c., carried on by W. H. Stansbury and H. Ashton, at 37, Moorfields, Liverpool, as W. H. Stansbury and Co.

Upper Wharfedale Motor 'Bus Co. (Ltd.), 5, Charles Street, Bradford.—Capital, £1,500 in £1 shares.

Vivinus Motor Cars (Limited).—Capital, £120,000 in £1 shares (60,000 7 per cent. cumulative preference). Object, to acquire the business of manufacturers of automobiles carried on at Brussels and elsewhere by Les Ateliers Vivinus Société Anonyme. First directors, Comte Jacques de Liedekerke, G. Kerke, A. Vivinus, Sir Thomas Barclay, and J. Gardiner.

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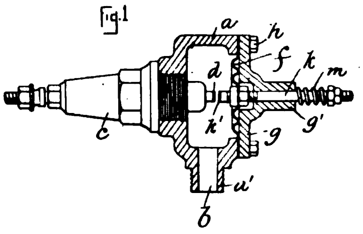
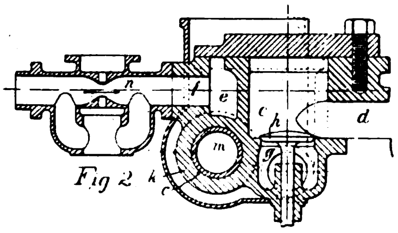
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

6825. 31st March, 1905. Improvements in Ignition Mechanism for Internal Combustion Engines. William S. Rhodes and James Rhodes, Cliff Cottage, Brow, Haworth, near Keighley, Yorks. This invention relates to electric ignition mechanism for internal combustion engines, and is especially for use in connection with a low-tension current, and consists in the production of this mechanism of such a formation or construction that contact may be made and broken within the cylinder without having any working parts passing through any of the walls of the cylinder, through or by which the gases may leak or escape, by reason of the wearing of such parts. There are five figures. Fig. 1 is a longitudinal section of this mechanism. A box or casing, *a*, is made to screw by the screwed part, a^1, into the wall of the cylinder, to which it has to be applied, in the same manner as at present is mounted the ordinary sparking-plug, with an opening, *b*, leading through the part, a^1, entering such cylinder wall to form a passage therefrom into the casing, *a*. The casing, *a*, has one of its side walls formed to receive an ordinary sparking-plug, *c*, carrying one terminal, *d*, while the other wall is formed by a sheet-metal diaphragm, *f*, fitting against the surrounding walls, where it is held by a supporting cover, *g*, fixed by screws, *h*, taking into the surrounding walls. The fitting of this diaphragm, *f*, and its cover, *g*, against the walls of the casing, *a*, is carried out in such a manner as by using packing substances or otherwise to produce a joint that will withstand the internal pressures of the cylinder, and within the casing without leakage, while the cover, *g*, also affords support for the diaphragm, *f*, to withstand all pressures acting thereon. The cover, *g*, is also formed by having a boss, g^1, to afford support for a rod or spindle, *k*, extending through and rigidly secured to the diaphragm, *f*, and this spindle, *k*, is made so that a spring, *m*, may be mounted upon it to cause it to recede or tend to recede, and withdraw its inner end, k^1, from contact with that of the terminal, *d*, within the casing, while the diaphragm, *f*, is of a wavy or corrugated formation, to afford sufficient resilience or yield to allow the spindle, *k*, to carry it with it when it is being pressed against the terminal within the casing. The spindle, *k*, is operated by being pressed in the direction of its length by any of the well known mechanism at present in use.—4th April, 1906.



9506. 5th May, 1905. Improvements in or relating to Vaporisers for Internal Combustion Engines. Thomas H. Gardner and Edward Gardner, Barton Hall Engine Works, Patricroft, Lancs. This invention relates to the vaporising arrangements of internal combustion engines. When a burner having an exposed flame is allowed to play on the vaporiser of an engine, there is the liability of the flame setting fire to any explosive or combustible mixture which may collect about the engine. One object of this invention is to remove or lessen this risk. Another object is to enable the waste gases exhausting from the engine, and the combustion within the engine, to be usefully employed in a convenient manner for maintaining the vaporiser or vaporisers at a suitable temperature. There are thirteen figures Fig. 2 illustrates the vaporiser. It consists of a casting having a central chamber, *c*, which communicates by a port, *d*, with the combustion chamber of the engine. The vaporised fuel charge gains access to the central chamber, *c*, by way of an outer chamber, *c*, which partly surrounds the central chamber. The liquid fuel charge to be vaporised is led through the port, *f*, into this outer chamber (in which vaporisation takes place) about the centre of the chamber, and divides into two parts, which pass outwards to the wings of the chamber and then pass downwards and unite in a chamber, *g*, situated below the admission valve, *h*, which is situated at the bottom of the central chamber. When the admission valve is open the vaporised charge can pass upwards from the chamber, *g*, into the central chamber. The vaporiser is provided with a hollow cylindrical snug or boss, *k*. The hole, *m*, in this boss passes right through the boss, and does not communicate with any of the chambers or ports of the vaporiser already mentioned. The explosive charge of air and fuel is supplied to the outer chamber of the vaporiser from a fuel feeder, *n*, which may be directly bolted to the vaporiser casting. This fuel feeder does not form part of this invention. When the engine is working normally the products of combustion from the engine, or some of the products, pass through a pipe, *o*, which is itself passed through the hole, *m*, in the boss of the vaporiser. The heat from these waste gases, together with the heat of combustion of the charge, will be sufficient to maintain the vaporiser at the necessary or desirable temperature.—April 4th, 1906.



Patent Specifications Published.

Applied for in 1904.

Published April 26th, 1906.

29,175.	G. F. Sturgess Variable speed and brake hubs for motor cycles.

Applied for in 1905.

Published April 19th, 1906.

2,517A.	T. Gare. Resilient wheels.
6,110.	D. J. Thompson. Clutch gear.
6,452.	J. Stevens. Cushion tyres.
6,729.	J. B. King. Intl. combn. engines.
6,825.	W. S. Rhodes and J. Rhodes. Ignition mechanism.
7,075.	J. A. Main. Electrically-controlled device for operating valves.
8,118.	W. M. Simpson. Steam generators.
9 372.	T. W. S. Hutchins. Variable speed gear.
9,506.	T. H. and E. Gardfer. Vaporisers.
10,860.	A. G. Melhuish. Intl. combn. engines.
11,880.	J. N. B. Moore. Wheels.
14,411.	T. W. Kings. Intl. combn. engines.
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2,243.	A. F. Evans. Oil engines.
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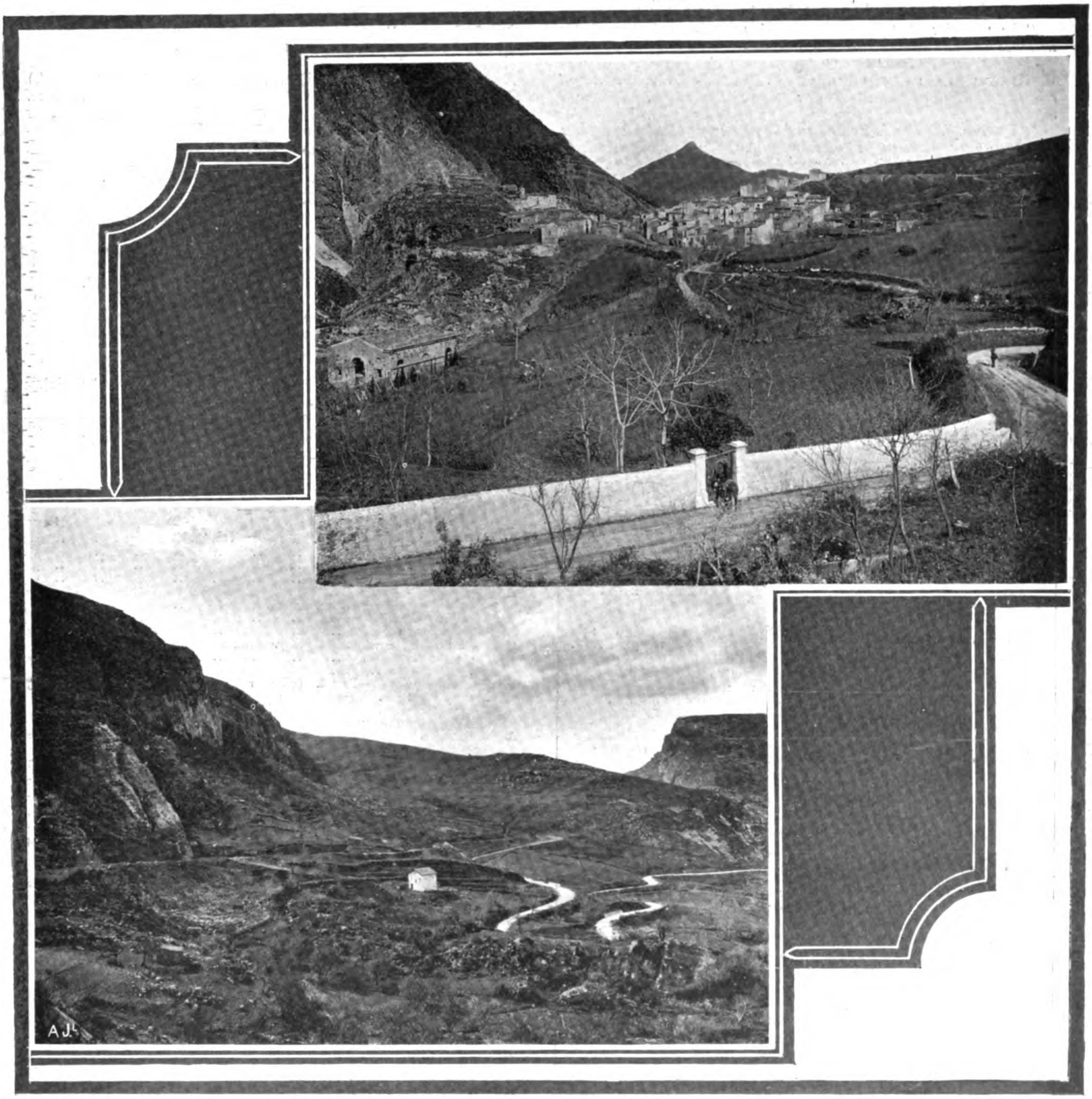
26,237.	J. P. Fox. Ignition devices.

The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

No. 278. (No. 18, Vol. XI.)] MAY 5TH, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.



THE TARGA FLORIO RACE IN SICILY, MAY 6th.—Two interesting pictures taken on the Sicily Race Course. In the top photograph is seen Campo Felice, on the borders of the sea coast, and one of the corners of the course. The lower picture shows another of the many twisting roads before arriving at Campo Felice.

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

British Events.

May 5	...	Cars and Tricar Trial (Southern M.C.).
May 5	...	Hill Climb and Brake Test (Essex A.C.).
May 5	...	Welbeck Car Trials and Wilson Cup Race (Notts. A.C.).
May 5	..	British Motor Boat Opening Meet.
May 12	...	South Harting Hill Climb.
May 12	...	Open 150 Miles Non-Stop Run (Essex M.C.).
May 24	...	Frome's Hill Climb (Herefordshire A.C.).
May 26	...	Motor Union Meeting (Birmingham).
June 9	...	Hill-Climb (S. Herts A.C.).
June 11–16	...	Land's End to John O'Groat's (Auto Cycle Club).
June 13–16	...	Scottish Reliability Trial.
June 30	...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July	...	Motor Yacht Club Reliability Trials.
July 14	...	"Henry Edmunds" Hill Climb.
July 21	...	Motor Union Meeting (Bath).
Aug.	...	*Van Trials.
Aug. 6–18	...	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8	...	International Cup (Motor Boats) Eliminating Race.
Aug. 9	...	International Cup (Motor Boat) Race at Ryde.
Sept. 22	...	Motor Union Meeting (York).
Sept. 27	...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

May 6	...	"Targa" Florio (Sicily).
May 12–24	...	Tour de France (Motor Cycles and Voiturettes).
May 14–31	...	Milan Reliability Trial.
May 27	...	Motor Bicycle Championship (Moto Club de France).
June 4	...	Rochet-Schneider Cup (Auvergne Circuit).
June 6–13	...	Herkomer Cup.
June 17	...	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26–27	...	Grand Prix (A.C. de F.).
June 28–29	...	Kiel Motor Boat Races.
July 8	...	Motor Bicycle International Cup Race (Austria).
July 14–17	...	Ostende Meeting.

* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

The "Electrobus" Flotation.

From the moment we recognised that an appeal on a large scale was likely to be made to the public on behalf of the company formed to exploit the possibilities of the "Electrobus," we at once took up a very firm attitude of opposition to the whole project, and adopted a decided line of action. Before the public appeal was actually made, before we had even seen the prospectus which the company was about to issue, we sent round to the leading London and provincial daily papers a letter pointing out how impossible it is, under existing circumstances, to run electrically-propelled 'buses on commercial lines. This letter brought about a considerable number of articles universally condemning the scheme, and a considerable amount of correspondence ensued in various newspapers. In order to provide a record of the principal elements in that correspondence, we have collected these letters together and now reproduce them, accompanied by the necessary explanations of the circumstances under which they were written and under which they appeared, in another part of The Automotor Journal this week.

◆ ◆ ◆

A Word of Explanation.

It is due to the public and to our readers, no less than to ourselves, to make our position on the whole question, and the reasons for the somewhat drastic action we have taken, fully and completely understood. We have acted throughout wholly and solely for what we believe to be the true interests of the general automobile movement. It is almost unnecessary to state that we are not interested, either directly or indirectly, in any way whatever in any petrol or steam 'bus undertaking. We have no prejudices on the question, and all that we desire is to see the best type or types of motor 'bus commercially triumphant, whatever the source of power employed to propel them. Considering, indeed, the many great advantages of electric traction, its silence, noiselessness and flexibility, and calling to mind how much we were identified with it in the early days when its prospects seemed promising, none would be more delighted than ourselves should a revolution in secondary battery construction render the electric 'bus a commercial possibility for public transport purposes. But what we do still dread, and have always dreaded whenever there has been a tendency to "boom" any particular branch of the industry for company promotion purposes, is that fiasco may result, public confidence be shaken, and the support of the public as a consequence either withdrawn from or refused to branches and departments of the industry which may have no connection whatever with the branch in which the fiasco took place. Now facts and figures satisfied us, *a priori*, that a fiasco of a serious nature was bound to overtake this particular company, but that its prospects might strike the public as being most rosy. Incontrovertible figures prove, as will be seen from the letters to which we refer above, and from our articles of last week, that it is an impossibility to carry on under existing circumstances an electric 'bus system on paying commercial lines. When that is the case, a crash sooner or later—however deferred it may be by ingenious methods of shifting the financial burden on to enterprising accumulator makers—is certain to come. It was with this in view that we once more determined to do all that we could to warn the public and to save them, as far as possible, from embarking in a scheme in which loss and disappointment, with their consequent ill results for the development of the industry, are apparently certain. Unfortunately we were unable to place the facts of the situation before the public quite early enough, and, owing partly to the fascination that the idea of electric traction still possesses for very many, and to the attention which the obvious shortcomings of many of the petrol 'buses have excited, enough applications were made for shares—some 100 odd thousands, it is said, out of the 305,000 which were asked for being applied for—to enable the company to go hurriedly to allotment. A considerable number of investors are thus, unfortunately, committed to an undertaking which is as certain as anything on this planet can be, to collapse in utter failure sooner or later—probably very soon.

◆ ◆ ◆

The Financial Aspects—a Ray of Hope.

We do not propose to go outside our proper province in dealing with the financial aspects of the promotion, particularly as these have been very ably handled by the papers which make a speciality of that side of commercial questions. On one important point, however, on which we touched last week—the inadequacy of the disclosures made in the prospectus—we find that various applicants for shares have been coming to the same conclusion as we did, and at least three different firms of solicitors have been instructed by applicants for shares to apply for their cancellation on the above grounds. Should these cases be decided in favour of the applicants, the result will, of course, follow that all other shareholders who desire to do so will be enabled to withdraw provided they have given notice in time, so that the results of the legal action thus foreshadowed will be doubtless awaited with interest by a considerable number of people.

◆ ◆ ◆

The Battle of the Bridges.

The battle of the bridges is beginning once more, though strangely enough the prospects of bringing the trams over them do not appear quite as dangerous as they did during the last Parliament, when the Lord Chancellor was burlesqued by *Punch* in the character of Horatius keeping the bridge. It will be remembered that under the last Government the question, which was not made a party one, but left to the free decision of the House of Commons, resulted in an exactly equal number of Members voting for and against the proposal, the Speaker giving his casting vote, which decided the question in favour of the measure, and so brought it up to the House of Lords, where it was promptly rejected. A Select Committee of the House of Commons has been appointed for considering the London County Council's scheme for bringing the tramways over the bridges, the scheme being exactly the same as that on which the last Parliament pronounced in the manner described above. Since that occurrence, however, a great deal of water, as the proverb goes, has flowed under the bridges, and a great deal of development has taken place in the traffic that passes over them. In fact, since the question last came before Parliament, the motor 'bus has arrived, and that makes all the difference. For the trams-over-the-bridges project is now being opposed by powerful bodies, about whose interest in the question and whose *locus standi* there can be no possibility of doubt, and even the

County Council is casting a furtive eye upon the motor 'bus as a possible municipal trading institution. Formerly the opposition to bringing the trams across the bridges, and, in particular, running them along the Embankment, was represented by certain newspapers as being due wholly and solely to the interests of private carriage owners and the proprietors of motor vehicles. With a certain section of the public, the interests and preferences of this class of person are only considered with a view to devising means for thwarting them. Now, however, the situation is totally different. The carrying interest of a large number of vehicles, which have been proved to be the fastest and most useful for street passenger transport, is seriously threatened, and it is accordingly a question that concerns the public quite as much as formerly any extension of the tram service could possibly have benefited them. If the trams are allowed to cross the bridges, the impedance to motor 'bus and other traffic will be enormous. In some cases it will be almost prohibitive. This is the view which is being put before the Select Committee now considering the question by representatives of powerful companies engaged in catering for the public convenience. If in this way the motor 'bus should be successful in combating the contemplated destruction of the Embankment—the finest thoroughfare in London and in England—if it prevents the dislocation of traffic which would result from bringing the trams over the bridges, and the unpleasant appearance which they will present against the sky line when crossing them, to say nothing of the incongruity of tram lines up Parliament Street and Whitehall, Londoners and all who wish to preserve, as far as possible, the pleasanter features of the Metropolis, will have much to thank them for.

◆ ◆ ◆

Not Obstructing the Police.

Automobilists generally, and the Automobile Association in particular, will doubtless hear with satisfaction that the Croydon magistrates last week (about the time we were going to press) decided, after presumably giving very careful consideration to the question, that informing motorists of the presence of a "motor trap," or a "police trap," or a "police motor trap," whichever term may be preferred, does not constitute obstruction to the police in the execution of their duty, as contemplated by the Act which deals with that offence. This decision is in accordance, it seems to us, with law and common sense, as we have pointed out at various times when referring to the subject. Obstruction of a punishable kind has always been understood to be of a physical or quasi-physical character, except, of course, where it constitutes an indictable offence, as in the case of harbouring a criminal or assisting him to escape. It is unfortunate that one Petty Sessional Court is not in any way bound to take notice of the decisions arrived at by another. There is nothing, therefore, to prevent the police taking out similar summonses in similar cases in other districts. At the same time the decision of the Croydon magistrates is unquestionably in accordance with sound law and common sense, and as it was given after considerable consideration it ought to produce a certain effect in the minds of magistrates in other Courts. It is to the Motor Union that Mr. Little, who was the defendant in this case, is indebted for his support in the action, and we understand that the Motor Union will also appear in support of the decision of the magistrates when the case is re-fought in the Divisional Courts—the police having asked the magistrates to state a case.

Throwing the Onus on the Driver.

A CASE was brought before the Tower Bridge Police Court recently at the instance of the London County Council in which the London Motor Omnibus Company was summoned for using locomotives which did not so far as practicable consume their own smoke. Evidence was brought forward which showed that the smoke was entirely due to an excess of lubricating oil, and was not in any way a defect inherent in the engine. It was further stated that when smoke was produced under such circumstances the driver was to blame for making an excessive use of the lubricant, and therefore the company should not be held liable, but rather the driver. The decision in this case, which was adjourned, will be awaited with general interest.

Sand Replaces Water.

IT is satisfactory to find that the absurdity of attempting to extinguish a petrol conflagration by means of water, is obtaining universal recognition, not only among the general public, but even among fire brigades. This is to some extent due to the action of the London County Council, who have approached the various corporate bodies of London with a view to arranging that they should be adequately supplied with sand for the purpose of extinguishing petrol fire, and it has now become customary for each engine to be supplied with some 2 cwt. of sand in case it is compelled to combat with petrol fire in the course of its duties. The County Council officials are even proposing to establish depôts of sand for this purpose at various points, such as street corners, in the same way that gravel and comminuted shells are stored for enabling the horses which still remain at work in London to obtain a better grip of the ground when the streets are slippery.

The Motor Omnibus to the Rescue.

THE Motor Van, Wagon, and Omnibus Users' Association, through the Secretary, have issued the following circular to the companies using motor vehicles in the Metropolis:—

> "The Motor Van, Wagon, and Omnibus Users' Association has under consideration what steps can be usefully taken in the interests of the companies operating motor omnibuses, to bring pressure to bear on various Borough Councils in the matter of road surfaces in London. The excessive wear and tear caused by the condition of dis-repair into which they are permitted to fall, and the slow and leisurely way in which repairs are made, involve a very heavy burden upon the traffic using the highway.
>
> I shall be glad to know:—
>
> 1. What action your Company has taken in the way of approaching local authorities in the matter.
> 2. What roads in London do you find are usually abnormally bad?
> 3. The number of breakages that your vehicles have suffered, and which you attribute to the irregularity of the paving.
>
> "The Committee are also considering at the same time the question of central standards and refuges, and in this connection I shall be glad to have the experiences of your Company, and what statistics of accidents caused by the existence of central standards you have in your possession."

It is hoped that the circular will meet with an adequate response, and that the authorities responsible for the maintenance of the road surface will be galvanised into a proper state of activity. Every traveller by motor 'bus must have fully realised what a serious strain upon vehicles of any kind travelling at reasonable speed the condition of many of the London roadways causes. In less degree the same source of annoyance affects all others who employ vehicles of any description in the Metropolis. If the motor 'bus movement should be successful in causing adequate improvement to be effected, it will earn the thanks of all Londoners.

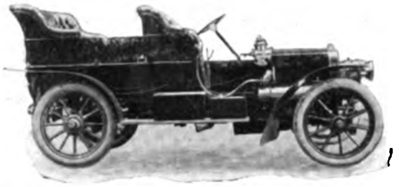
How to Recognise the Cars of To-day.

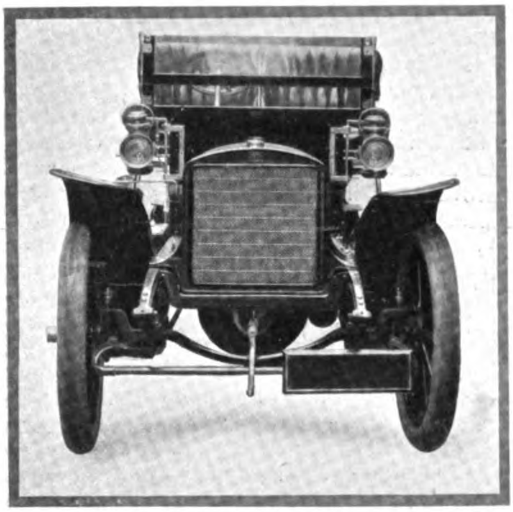
(No. 25).

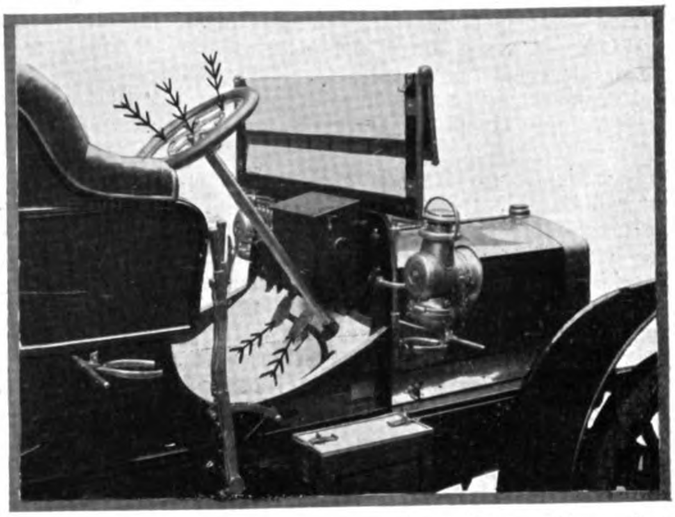
The National

(BRITISH)

18 H.P. & 36 H.P.

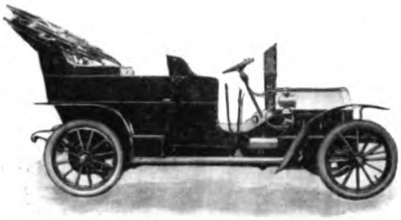






An IMITATION HONEYCOMB RADIATOR is fitted in front of the bonnet, which distinguishes it from others of a similar shape. THREE CONTROL LEVERS are mounted above the steering wheel, and another characteristic detail is the smooth oval pedals.

* * *

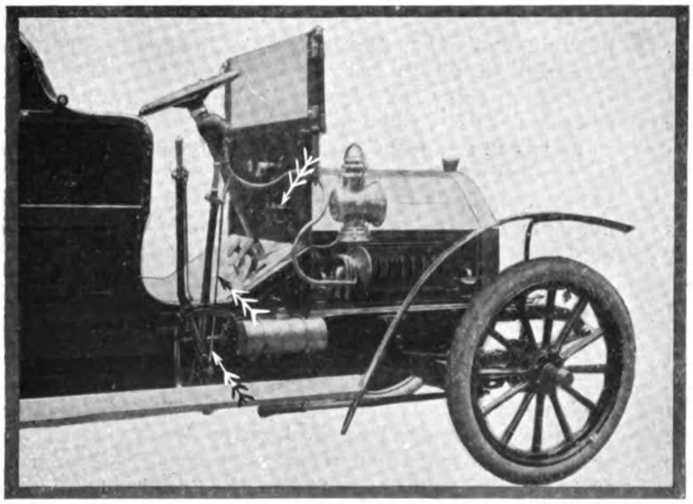


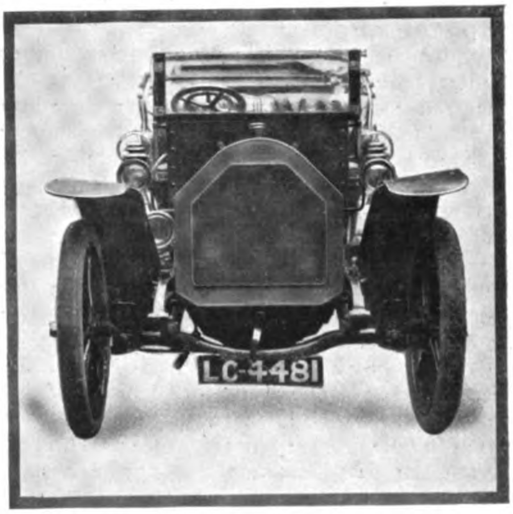
(No. 26).

The Vinot

(FRENCH)

16, 20, 30, 45 & 50 H.P.



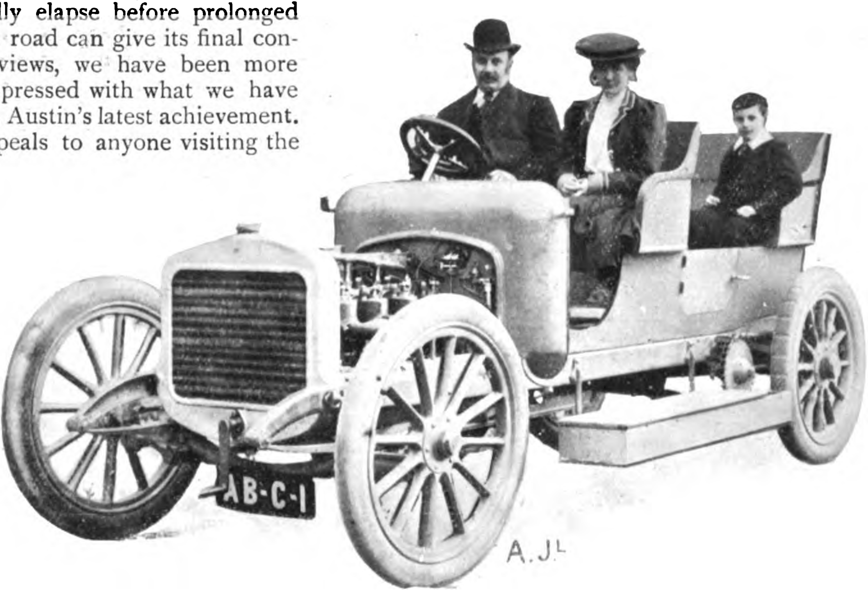


Vinot et Deguingaud Cars have a HONEYCOMB RADIATOR in which the tubes are surrounded by a VERY WIDE FRAME. There are very few fittings on the dash, but the neat LUBRICATOR is noticeable. A sure means of identification is the CHANGE-SPEED LEVER, which has a long thin rod connected to the trigger, passing down to the fulcrum for the purpose of operating the locking mechanism.

THE AUSTIN PETROL CARS.—PART I.

AN "A1" British model, which combines, with the widely-recognised reliability of the "Wolseley" cars designed by Mr. Herbert Austin, the best and most popular features of up-to-date, orthodox practice.

UNQUESTIONABLY, the "Austin" cars are destined to figure in the very front rank amongst high-class petrol vehicles, and it is without the slightest hesitation that we welcome them as an enormous acquisition to the British industry. Even before Thursday last—when we visited the place of their birth on the occasion of the inaugural function connected with the completion of the first Austin car—it was a foregone conclusion, with all those who were well acquainted with Mr. Austin, that his latest productions would be a credit to this country. And now we are bound to confess that this remarkably successful designer and builder has exceeded the anticipations of his best friends. Unless we are much mistaken his new cars will be able to hold their own with any of those produced either in this country or abroad, for although time must naturally elapse before prolonged experience on the road can give its final confirmation to our views, we have been more than favourably impressed with what we have already seen of Mr. Austin's latest achievement.



Mr. H. Austin, seated at the wheel of the first car turned out at his new works.

What chiefly appeals to anyone visiting the newly-equipped factory at Northfield is that the Austin chassis is pre-eminently a workmanlike job from start to finish, and that, throughout its design, an extraordinary degree of wisdom has been brought to bear upon making a well-considered compromise between those points which are merely popular and those which are essential on sound engineering principles. Thus, it may be said that nearly every characteristic which has been boomed far and wide as a modern improvement is found to have been incorporated upon the car, but it is at the same time quite evident that intelligent absorption has taken the place of that merely slavish—sometimes incongruous—adoption which has at times been so noticeable in the work of less skilled designers. The result is that purchasers are not only given all that they fancy they want, but they are also given that which they will appreciate even more highly after they have owned a car for some time.

It is impossible, moreover, to ignore the fact that Mr. Austin has done even more justice to himself in his new surroundings than ever before, and it is hardly too much to conclude—from the visible results of his work during the past few months—that he has been better able to concentrate his full attention and to devote the whole of his accumulated experience upon the design of an up-to-date touring car than was possible when he carried the wider responsibilities of his recent Company upon his shoulders. He has not gone back on those early principles which have won for the "Wolseley" cars so great a reputation for reliability, neither has he adopted a policy of extravagance in connection with the cost of production; but he has carefully weighed all the *pros* and *cons* of various forms of construction, has evidently made a close study of the work of other manufacturers, and has introduced many very important improvements of his own.

The 25–30-h.p. model is that which has been first completed, and it was a chain-driven car of this type that was finished off ready for the road last week. Our illustrations show that it has a neat appearance, and that the chassis is admirably adapted to take any form of touring or town body. A trial run proved that it is sufficiently light in relationship to its power to render it extremely flexible and lively even upon heavy roads, and that the suspension is such as to afford most comfortable and easy riding. The power, too, is apparently ample for maintaining a high average speed with very little need for gear-changing on roads of a fairly hilly character, and yet the engine is so flexible that the car can be made to crawl at walking pace on the top gear without any manipulation of the clutch-pedal. Its powers of rapid acceleration appeared to us to be one of the most satisfactory features of this first "Austin" vehicle—a strong testimony in itself to the efficiency of the transmission, as well as to the good qualities of the engine. Silence is another merit that has been achieved by careful design combined with excellence of workmanship, for not only are the exhaust-gases compelled to escape noiselessly, but all risks of rattling or of knocking in any part of the mechanism have been effectively guarded against.

The Austin Factory.

Concerning the Company's works at Northfield, comparatively little need be said, especially in view of the amount of space which must necessarily be devoted in an article of this character, to the hundred and one important points connected with the actual design of the new cars.

The factory is, however, admirably suited for the construction of motor cars, and the existing buildings are of ample size for coping with a large output, while, in addition, the Company have the great advantage of being so placed that large extensions can be at any time made. The present equipment leaves nothing to be desired from the manufacturing point of view, the whole of the machine tools being of the most modern character, laid down for the particular work that they have to do. The various shops are also conveniently arranged in relationship with one another, and everything, in short, is well calculated to enable the Company to keep down the cost of production, while at the same time maintaining the highest standard of workmanship.

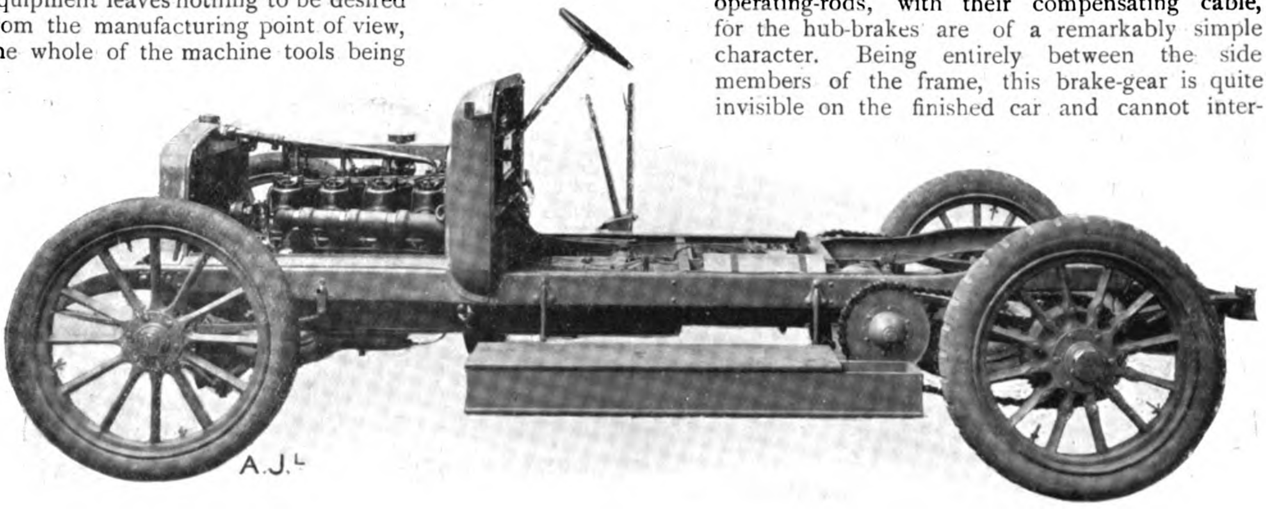


Fig. 1.—Side view of the 25-30-h.p. "Austin" Chassis—fitted with side chain transmission.

Leading Characteristics of the Cars.

As shown by the illustrations (particularly Fig. 2) which we reproduce this week, the chassis has an extremely neat and businesslike appearance, which is partly due to the arrangement of the gear-box close up to the multiple-disc clutch (inside the fan fly-wheel) and to the fact that the differential countershaft is enclosed within an independent casing. Other reasons are, however, that the brackets by which this casing is secured to the side members of the frame also serve to carry the front ends of the radius-rods and the front shackles for the long side springs, and that the operating-rods, with their compensating cable, for the hub-brakes are of a remarkably simple character. Being entirely between the side members of the frame, this brake-gear is quite invisible on the finished car and cannot interfere with the wings, steps or side entrance doors. The petrol-tank is also quite out of the way at the extreme rear, its curving profile corresponding with the special shape of the main frame. Added to this, the chassis, as a whole, gives the pleasing impression of being very well-proportioned, for, although it is obviously of substantial construction, it is far from looking either clumsy or unduly heavy. Each and every part is strong, and has large bearing surfaces; there is a very noteworthy absence of complication; accessibility combined with dust-proof casings has been provided for; and although every provision has been made for the proper lubrication of even the smallest moving part, yet leakage of oil from the bearings has been carefully guarded against.

As already stated, most of the popular characteristics of present day practice have been incorporated into the

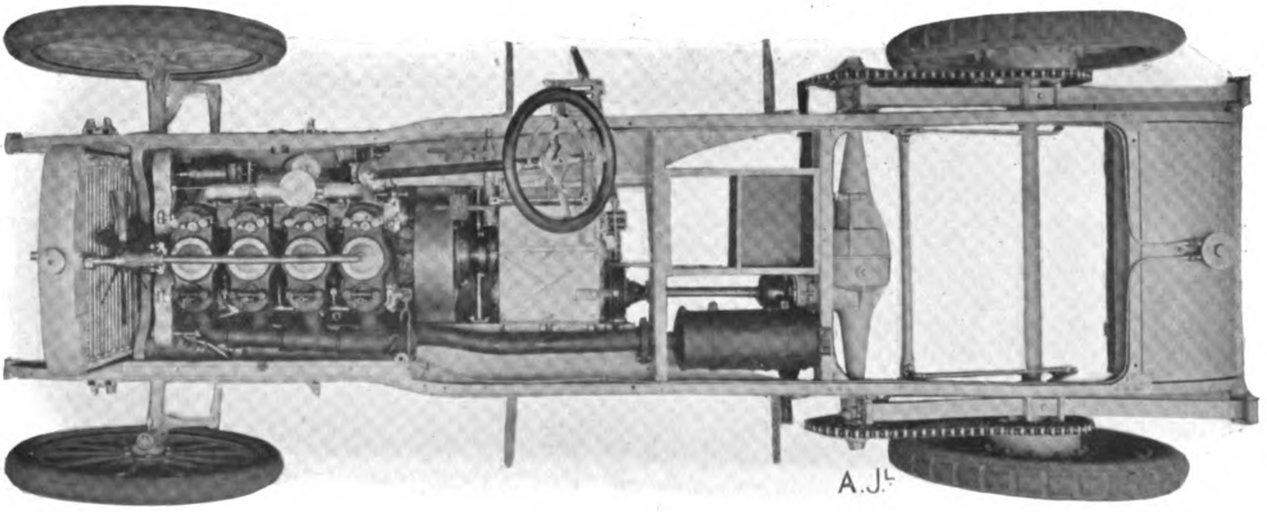


Fig. 2.—View from above of the chain-driven 25-30-h.p. "Austin" Chassis, showing the compact 4-cylinder engine with its jointed exhaust-pipe fitting, the 4-speed gear-box close up to the multiple-disc clutch, the independent casing containing the differential countershaft, the long rear springs and the neatly placed pressure-feed petrol tank at the back.

new cars. Thus, for instance, the throttle and ignition levers are fitted above the steering wheel; magneto ignition is available as well as the usual battery system; the engine has an automatic governor that is subject to the control of an accelerator-pedal; the crank-shaft has five bearings; the main clutch is of the multiple-disc type; and the change-speed gear is operated "*à la* Mercedes," &c., &c. About the only thing of the kind on which Mr. Austin appears to have taken a definite stand is in the matter of the "direct drive," preferring, as he does, to obtain a fairly efficient transmission on *all* speeds rather than to sacrifice the efficiency on the lower gears for a slight gain on " top " speed.

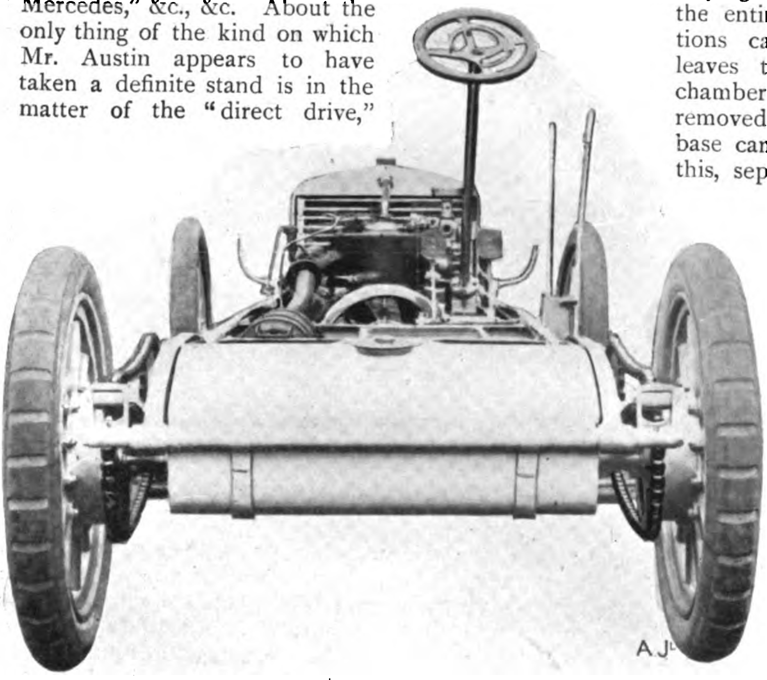


Fig. 3.—Rear view of the 25-30-h.p. "Austin" Chassis.

So far, indeed, have the demands of the majority of purchasers been studied that although Mr. Austin personally still advocates the employment of side chains rather than of live-axles, yet the present 25–30-h.p. car is so constructed that it can be turned out with either of these forms of "drive." Comparatively few additional parts are, as a matter of fact, needed in catering for this alternative choice, since the same gear-box is utilised in either case, and it is only the back axle and the arrangement of the differential with its chains or with its propeller-shaft that constitute the differences.

All the details of construction of the various parts will be described separately later, with the assistance of special drawings which have been prepared, and it will be found that nearly every portion of the chassis is well worth careful attention. Not only, for instance, is the frame itself, with its special planed surfaces for receiving the engine and the gear-box, unusual, but the rear springs are of a shape that is not often seen on existing cars, and the swivelled radius-rods which connect it with the back axle permit the springs to have absolutely free play.

The shape of the frame above the back axle allows it to be hung low, and the frame itself constitutes a partial dust screen—reducing the size of the detachable apron—beneath the engine, the clutch, and the gear-box.

It is probably the engine itself which will create most interest, however, for not only are the four vertical cylinders so cast separately that the metal cannot be distorted by unequal expansion or contraction, due to varying temperatures, but that clear waterways throughout the entire jackets can be ensured, since any obstructions can be seen and removed before the casting leaves the machine shop. Then, too, the crank-chamber is so made that either cam-shaft can be removed without disturbing the engine, and that the base can be taken down equally readily. Further than this, separate adjustments are provided for each of the valves and for each of the low-tension igniters in such a way that any or all can be brought into true synchronism while the engine is running. Even more immediately noticeable are the duplex ignition-fittings above the inlet-valves, and the arrangement of the exhaust-pipe that leads the gases from all four cylinders to the exhaust-box. The former constitute inspection-plugs for the valves, and are fixed in place in much the usual way but they not only have the necessary make-and-break mechanism for use in connection with the low-tension magneto, but also receive the high-tension ignition-plugs for the battery system. For the purpose of preventing the exhaust-pipe from imposing any strains upon the four cylinder castings, the exhaust-pipe fitting is made in four parts, which telescope into one another, and have neat stuffing boxes to make gas-tight joints. They also prevent the gases that issue from one cylinder impeding the flow from the others, for not only does the effective size of the pipe increase towards the rearmost cylinder, but there are internal baffles as well.

(*To be continued.*)

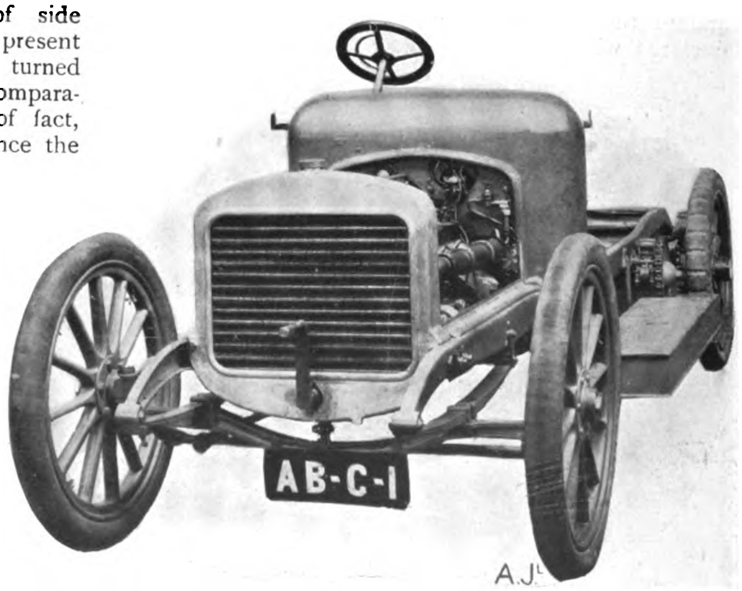
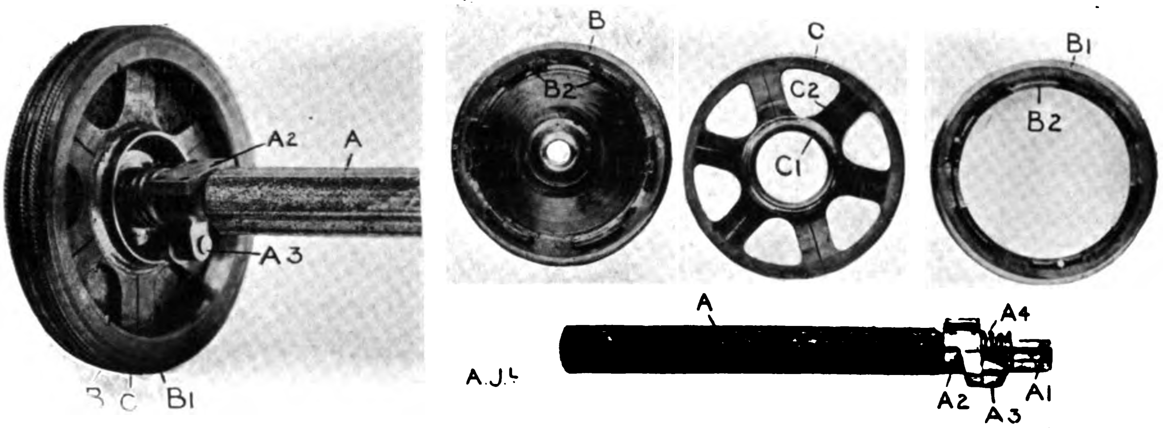


Fig. 4.—Front view of the 25-30-h.p. "Austin" Chassis, showing the straight tie-bar that passes across behind the axle to connect the two steering-heads together.

A NOVEL NON-SKID DEVICE.

This device aims at preventing skidding by automatically bringing a steel disc into contact with the road directly the tendency to side-slip occurs. It differs from most other examples of this principle, because the disc is not always running on the road, and when in action it takes the load off the wheel by a positive action.



This device is the invention of Mr. E. Otto, and we are indebted to Mr. S. F. Edge for the photographs of the model which illustrate it. Primarily intended for 'bus work, it is designed to be more particularly applicable to vehicles using twin-tyres. A special double road wheel, B, B^1, is constructed so that a disc, C, can be placed between the halves. This disc is of smaller diameter than the wheel, and consequently it does not touch the road except when forced to do so by a special mechanism provided for the purpose. Solid with the disc, C, is a projecting flange, C^1, which, when the wheel is in place, is adjacent to a conical roller, A^3, carried on a bracket, A^2, fixed to the axle, A. Normally the flange, C^1, is held clear of the roller, A^3, by the action of the spring, A^4, but if any sideways motion of the axle takes place relatively to the wheel, then the roller is forced on to the flange and the disc is brought into contact with the road to prevent skidding. It will, of course, be evident that since this action takes place whenever there is any relative sideways motion between axle and wheel, the disc is automatically brought into action when rounding corners or at other times when the direction of the car is suddenly changed and side-slip is most likely to occur; but it is essential that there should be sufficient initial grip between the wheel and road to enable the pressure of the spring, A^4, to be overcome before the disc can be brought into action. For the purpose of guiding the disc it is formed with broad, flat spokes, which pass between jaws, B^2, on the halves of the wheel.

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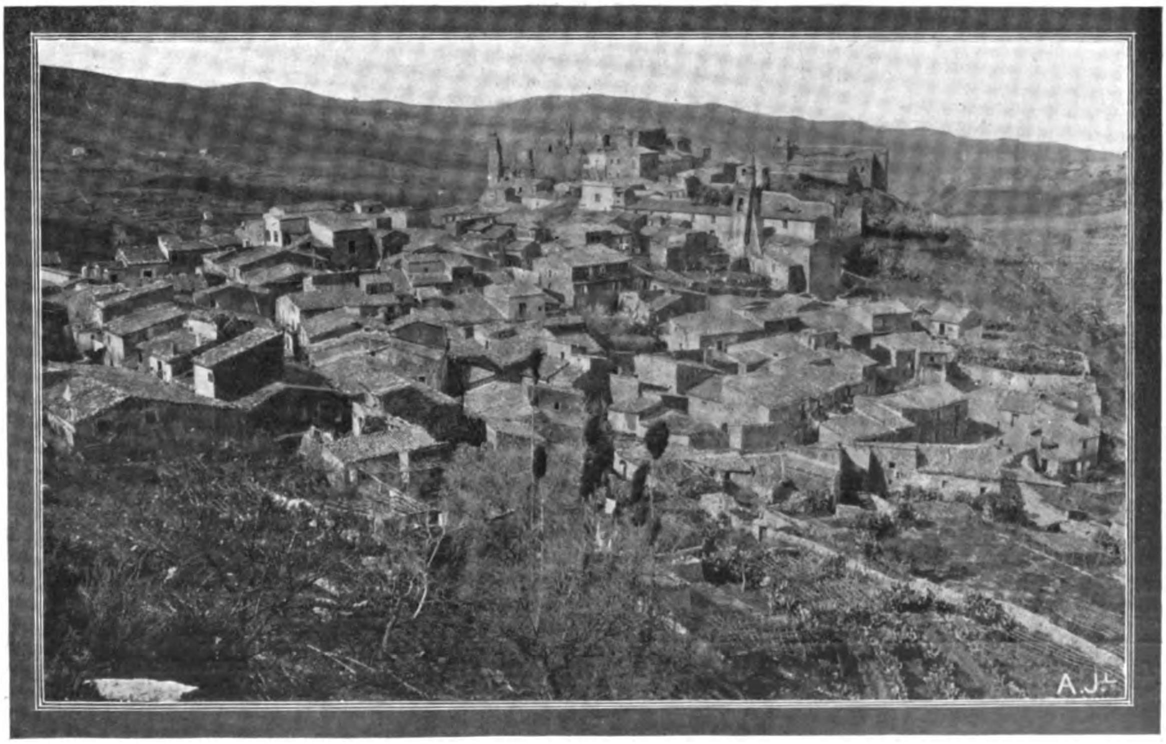
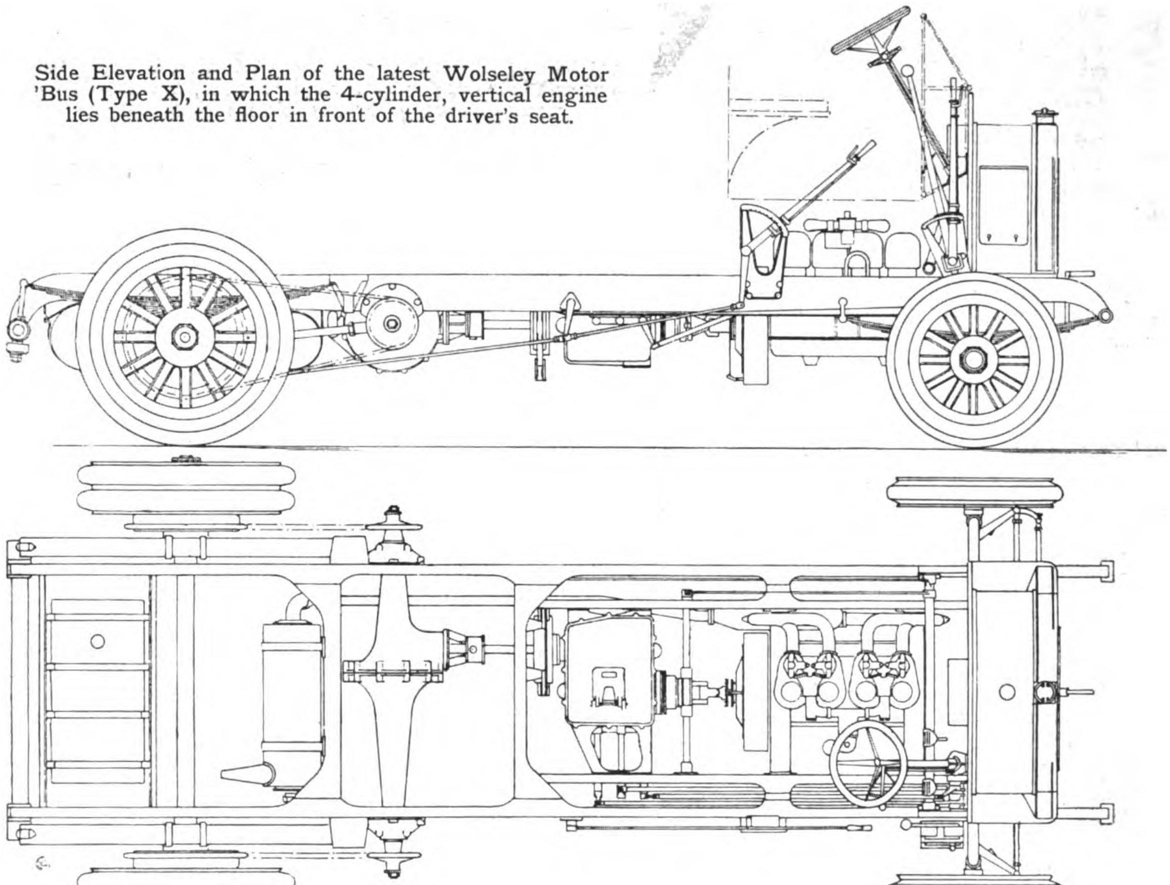


THE TARGA FLORIO RACE IN SICILY, MAY 6.—Isnello, a typical village on the course.

THE 30-h.p. WOLSELEY 'BUS (VERTICAL TYPE).

ALTHOUGH the latest 'bus chassis introduced by the Wolseley Company has a 4-cylinder vertical engine instead of a horizontal engine—like their previous models—yet the design is such as to still enable the engine to be placed beneath the floor in front of the driver's seat, and the latest 'buses are therefore as bonnetless as the earlier vehicles.

From the line drawings which we reproduce herewith, it will be seen that outwardly the new chassis is, in fact, very similar to those already dealt with in detail in our columns.* Naturally, the employment of the vertical engine, fitted in the orthodox position—although on a lower level than usual—has eliminated the earlier chain-drive between the clutch and the gear-box, and obviously, moreover, it has been necessary to employ bevel-wheels instead of spur-wheels for driving the differential countershaft. The clutch on the new chassis has a leather-faced cone, with springs beneath the leather to render it soft in action, while between it and the gear-box is a universal coupling. One noticeable feature is that the differential-casing is entirely distinct from the gear-box, the two mechanisms being connected together by a short shaft having universal joints at both ends.


Side Elevation and Plan of the latest Wolseley Motor 'Bus (Type X), in which the 4-cylinder, vertical engine lies beneath the floor in front of the driver's seat.

Primarily intended to accommodate 34 or 36 passengers, the overall length of the frame is 16 ft. 10 ins., the overall width of the vehicle is 7 ft. 2 ins., while the wheel base is 12 ft., and the track is 6 ft. 2 ins. Wood wheels are as a rule fitted, and these are generally intended to take 4-inch twin tyres at the back, and 4½-inch single rubber tyres in front; the rear wheels are 40 ins. in diameter, and the front wheels 32 ins. Complete with these tyres, the approximate weight of the chassis is 2 tons 18 cwt.

At a normal speed of 1,050 revs. per min., the engine develops about 33 b.h.p., but its normal speed is 900 revs. per min., and the chassis is usually geared to run at 3½, 5, 8, and 12 miles an hour at this speed. All four cylinders, the bore and stroke of which are 4½ ins. and 5 ins. respectively, are cast separately, and have the heads and jackets formed in one piece with them. The design is such that the mechanically-operated inlet-valves lie immediately above the exhaust-valves, and all the valves are operated from the one cam-shaft. The engine is, moreover, governed automatically, while the standard ignition system is of the low-tension magneto type, without any timing-gear. Concerning the change-speed-gear, comparatively little need be said except that the sliding-spur-wheels are arranged as three independent units (Mercedes fashion), and that the two gear-shafts are mounted in ball bearings.

We need hardly say that this new 'bus is the result of a considerable amount of accumulated experience and study on the part of the Wolseley Company. It is,

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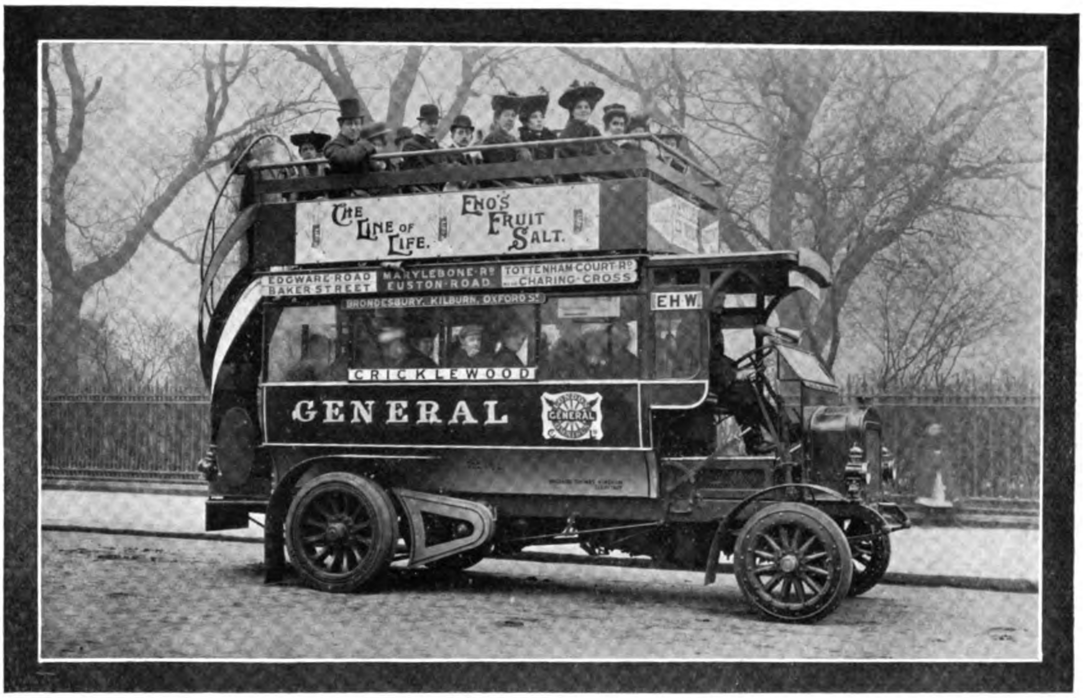
* *See* AUTOMOTOR JOURNAL, April 1st, 8th, 15th, and 22nd, and September 16th, 1905.


The Line of Life.
Eno's Fruit Salt.
EDGWARE ROAD BAKER STREET
MARYLEBONE RD EUSTON ROAD
TOTTENHAM COURT RD CHARING CROSS
BRONDESBURY, KILBURN, OXFORD ST
EHW
CRICKLEWOOD
GENERAL

One of the new 30-h.p. Wolseley Petrol 'Buses, fitted with a 4-cylinder Vertical Engine, which is now in regular service in London.

therefore, safe to say that numbers of them will soon be in evidence on the road. The photograph which we reproduce on this page, shows one of the first that has been built. It was supplied to the London General Omnibus Company, and is in regular service on the Cricklewood to Elephant-and-Castle route.

* * * *

An Effort towards Standardisation.

The committee of the Society of Motor Manufacturers and Traders, which has been appointed to deal with the question of accessories, has decided to adopt a standard size of flat tongue lamp bracket, as employed both for side and tail lamps. The tongue which they have determined to adopt is to be 3 in. high and $1\frac{3}{8}$ in. by $\frac{1}{4}$ in. at the base, tapering to $1\frac{1}{4}$ in. to $\frac{1}{16}$ in. at the top. We are glad to hear that a move in the direction of general standardisation has been thus inaugurated, even though it only refers to such a relatively subsidiary matter as lamp brackets. When the trade have universally adopted the standard agreed upon, no doubt the convenience will be found so great as to lead to standardisation on a more general scale.

The Advantages of Motoring Knowledge to the Dramatist.

At the present day the motor comes in for a large share of attention, not only in ordinary fiction, but in the drama as well. It plays a large part in the comedy of "The Fascinating Mr. Vanderveldt," which is now being performed at the Garrick Theatre. One of the most amusing pieces in the play is the scene in which Lady Clarice is induced by the fascinating Vanderveldt to take a run on a motor car with him, while he, with great ingenuity, arranges a series of disasters which strand them at a wayside inn. Mr. Sutro, who is a practical motorist as well as a capable dramatist, has given most unmistakable evidence of his capacity in the former *rôle* by the accuracy of the manner in which he deals throughout with all the motoring episodes.

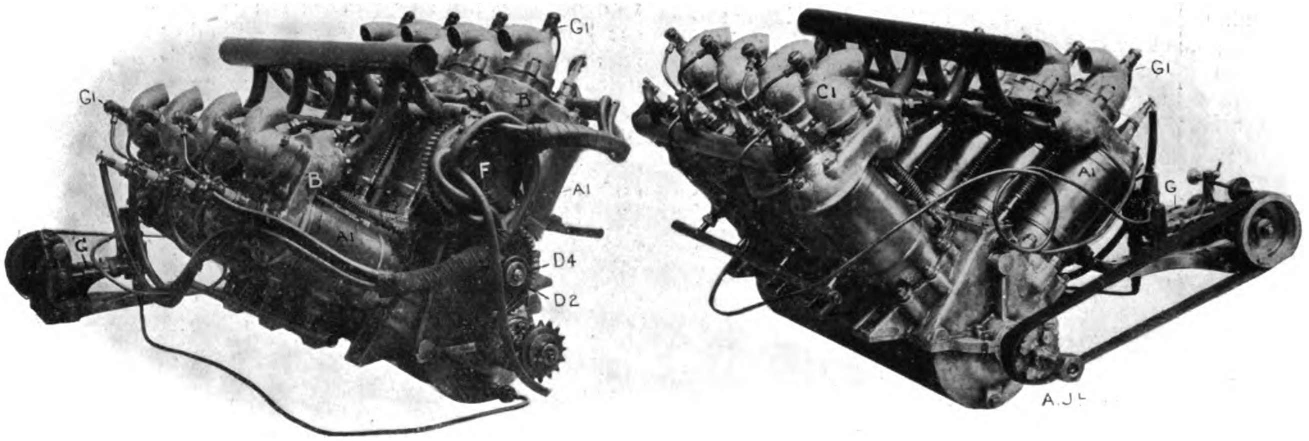
176 Yards Too Short for a Trap.

A case of exceeding the speed limit, against Mr. James Lock, was dismissed by the Chertsey magistrates last week upon the grounds that they did not deem 176 yards a long enough distance in which to time for trapping purposes.

Conveyance of Motor Cars by Rail.

The Midland Railway Company, we learn, have just sent into traffic a first instalment of a series of new covered trucks for the conveyance of motor cars over their line. These vans have been specially built for the purpose, and are fitted with side and end doors, the latter being so arranged that the largest cars can be conveniently and easily loaded. The trucks are 31 feet in length, and are as high as they can be built within the loading gauges. Sliding bars are fitted along the insides of the vans to which motor cars or road vehicles of any description can be secured. Strong leather straps are used for securing the wheels and other portions of the cars to the bars in question. The vans are large enough to hold two motor cars or one car and a large brougham, and although they are well ventilated, having ventilators on both sides, special precautions have been taken to prevent dust coming in through the ventilators. It is pleasing to make this commendable announcement for the benefit of car manufacturers and owners, as it is not so very long ago that some of the railway companies were inclined to place considerable difficulties in the way of the carriage of automobiles.

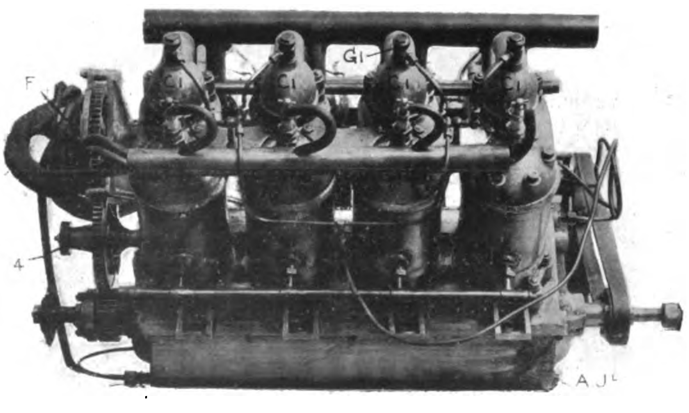
THE ANTOINETTE ENGINE.



The Antoinette Engine. Two views showing the arrangement of the diagonal cylinders. In both illustrations the pump, G, which feeds petrol direct to the inlet valve domes, is a prominent feature.

On the Continent, no more striking example of the 8-cylinder principle is available than in the Antoinette engine, which has been used with considerable success in the Antoinette boats—notably at the last Monaco meeting. This engine is about to claim a more direct interest from English marine motorists because Mr. Adams, of the Adams Manufacturing Company, has secured rights from the Levavasseur Company to manufacture them in this country. British-built Antoinette engines will, therefore, very shortly be placed upon the market. Already tests are in progress at the Bedford works with a view to the possible introduction of improvements in constructional details, but our photographs of the actual engine which is being tested, fully illustrate the leading characteristics of the system.

There is much that is remarkable about the Antoinette engine, for it embodies several points, which, if not novel in themselves, have at least seldom been brought together before on one engine to produce the same results. Primarily it is intended for boat work, and one of its features is that it is reversible, thus dispensing with the usual mechanical gear. Further saving of total weight has been obtained by constructing the cylinder heads of aluminium, and the water-jackets of copper.

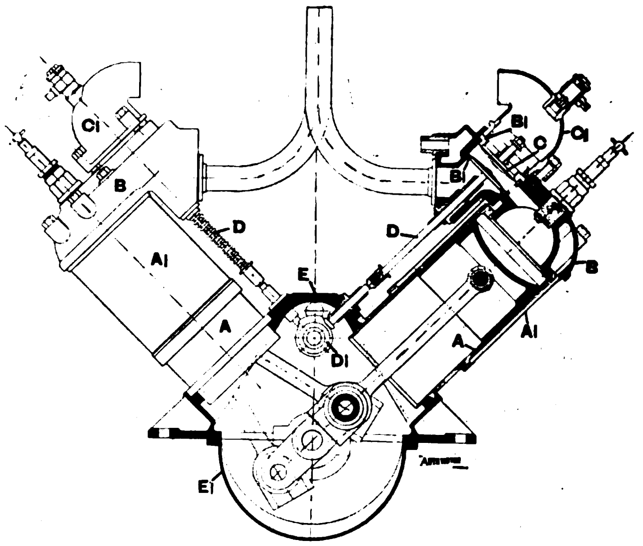


The Antoinette Engine. View showing the arrangement of the domes, C^1, over the inlet valves. On the left the reversing handle, D^4, is very prominent.

Diagonally arranged cylinders have been adopted because it reduces the space occupied and simplifies the crank-shaft. In this engine there are two connecting-rods acting upon each crank-pin, consequently the labour involved in the construction of the shaft is not much more than in the case of a 4-cylinder engine.

Each cylinder, A, is separately cast, and the copper water-jacket, A^1, surrounding it, is caulked into a groove in the aluminium cylinder-heads, B, in which the valve seats, B^1, are formed by steel liners. Atmospheric inlet valves, C, are employed, and the exhaust valves, D, are all operated by the same cam-shaft, D^1. There is no carburettor, but petrol is fed directly to each inlet valve through the fitting, G^1, by the force pump, G, which has a variable stroke for the purpose of rendering adjustable the supply of petrol delivered to the engine. Air enters direct from the atmosphere to the domes, C^1, above the inlet valves.

When reversing, the cam-shaft, D^1, is turned through an angle of 90 degs. by means of the handle, D^4. This



The Antoinette Engine. Sectional drawing of the engine showing the arrangement of the valves and the fixing of the copper water jacket.

Antoinette IV, the boat fitted with Antoinette engines which did so well at Monaco.

operation is performed without moving the gear-wheel, D^2, because the coupling by which the wheel transmits its power can be temporarily disconnected while the shaft is being re-set. Driven by the cam-shaft gear-wheel, D^2, is the ignition-commutator, F, which is, of course, adjusted by hand to suit the direction of running.

Although the engine of which we now give illustrations has only eight cylinders, this system of construction has already been applied to engines having twenty-four cylinders, and we understand that the weight can be brought down as low as 2·2 lbs. per h.p. on engines developing 180 h.p.

MOTOR BOATING.

Motor Yacht Club Fixtures.

A PRELIMINARY racing programme has been issued by the club for the coming season.

There will be a Fortnightly Handicap for members' boats, beginning Saturday, June 2nd, the other chief fixtures including May 26th, June 9th, 23rd, July 7th and 21st, Club Cruises.

August 1st and 2nd.—Reliability Trials in Southampton Water. August 3rd and 4th.—Judging of competing boats.

August 8th, at Ryde.—Eliminating Race to choose three boats to defend the British International Trophy, and a race for boats not exceeding 250 rating.

August 9th, at Ryde.—The race for the British International Cup, and races for boats (1) Exceeding 250, but not exceeding 1,000 rating; (2) Cruisers not exceeding 50 ft. o.a.

August 10th, at Cowes.—Boats under 1,000 rating, and for cruisers not exceeding 50 ft. o.a.

August 11th, at Seaview.—(1) Unrestricted racing boats, not exceeding 40 ft.; (2) Not exceeding 1,000 rating; (3) Cruisers not exceeding 50 ft. o.a.

Note.—Except in the Eliminating Trial, the British International Cup and the race for 40 ft. racing boats, all boats must be effectually silenced according to M.M.A. Rules.

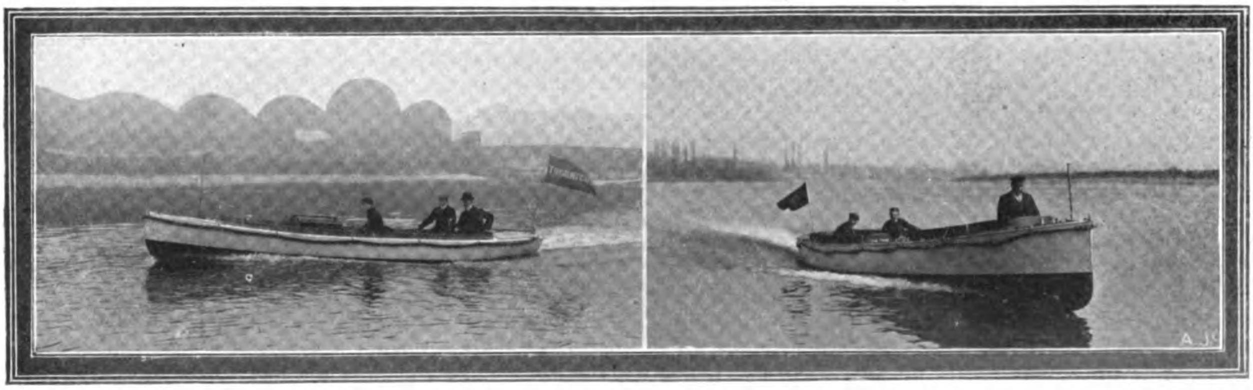
On August 18th there will be a Regatta in Southampton Water. On August 25th, a Club Cruise.

And on September 1st, the last Club Handicap of the season will take place.

Prizes will also be offered for races at Plymouth and Harwich.

British Motor Boats for India and Russia.

IN our photographs on this page we give illustrations of two steel motor boats which have recently been constructed by Messrs. Thornycroft and Company for service, the one in Kashmir and the other in Russia. The boat shown in the left-hand photograph is 25 ft. in length, and has been built for the Rajah Sir Armar Singh. She is fitted with a 2-cylinder 10-h.p. Thornycroft engine, capable of giving a speed of 8 miles. Paraffin can be used as fuel if necessary. This craft was built in three sections, in order to facilitate packing, as after delivery in India it will be transported 200 miles overland to Kashmir. In the right-hand photograph the 25-ft. boat illustrated is the property of Mr. Robert Kolbe, of St. Petersburg, and is for service in Vladivostock. This is also one of the Thornycroft boats, and as will be noticed



A brace of British-built steel motor boats, recently built by Messrs. Thornycroft and Co., for foreign service.

in the photograph is in rather an unfinished state. Although she was only launched on Wednesday, the 4th ult., she successfully completed her official trials, and was packed on the following Saturday. The boat is intended to be fitted with a cabin amidships, and the end of the coaming, to which the cabin is fitted, can be plainly seen round the boat. The weight of the cabin when fitted will lessen the tendency to lift at the bows when running. The boat has an exceptionally light draught, viz. 16 ins. with its full load, and the well-known Thornycroft arrangement of two propellers working on one shaft in a tunnel is employed.

International Cup Race for Motor Boats.

AUGUST 8TH has been selected for holding the Eliminating Trials to determine the three defenders of the cup on behalf of Great Britain, and Aug. 9th for the race itself.

Burton Cup.

FOR the second time, on April 24th, the Burton Cup for motor boats was run off at Cannes, over a distance of 100 kiloms. The winner was the cruiser "Consuelo," which covered the distance in 4h. 46m. 8s., three other starters having abandoned the race. Last year the Cup was secured by a C.G.V. racer, whose time was 2h. 45m. 16s.

Another Trip for "Napier Major."

"NAPIER MAJOR" continues to give the most satisfactory evidence of the reliability and durability of an ocean-going boat, fitted with petrol internal combustion engine. Our readers will all remember the lengthy and epoch-making tour which the boat carried out last year, and now she starts (to-day, Saturday) on an even more ambitious trip than ever before. She will leave Kingston-on-Thames, where she will have done duty on that day as the Press boat at the opening meeting of the British Motor Boat Club, and will proceed by sea to Inverness, not touching at any point between the mouth of the Thames and the Caledonian Canal. After accomplishing the 630 miles involved in this route, the intention is to run her through the Caledonian Canal to Islay, and then across the North Channel to Belfast, a further distance of 230 miles. From this point the intention is to call at Douglas, in the Isle of Man, and proceed to Liverpool. Then to cross the Irish Channel to Dublin, thence proceed by the Bristol Channel to Bristol, backing out again and round the Land's End to Cowes. In all, the distance it is intended to cover amounts to upwards of 2,100 miles, measuring from point to point. If "Napier Major" accomplishes it successfully, which there is every reason to believe she will, a further splendid record will be placed to her credit.

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PETROL-ELECTRIC 'BUSES AND THEIR FINANCIAL PROSPECTS.

BETWEEN the petrol vehicle and the electromobile pure and simple there is an intermediate type, which is known as petrol-electric, because it combines the petrol engine with an electric plant. It happens that this combination tends to retain the virtues and to discard some of the disadvantages of the two elementary systems of which it is composed, and realising this, we have, as occasion has offered itself, drawn attention to its merits, and urged its possibilities of application to commercial vehicles. During the past week or so, we have adversely criticised the attempt which has been made to introduce electric omnibuses in London; this week we are pleased to have an opportunity of showing that the petrol-electric omnibus, such as those which are shortly to be introduced by the Gearless Omnibus Company, must not be viewed in the same light as the electric 'bus, and, in fact, that it is a very different type of vehicle altogether.

Previous Systems.

There is no novelty about a petrol-electric system as such, but in the majority of cases it has only been applied to touring cars, which class of vehicle has, however, managed to develop very satisfactorily without it, mainly owing to the good design and workmanship which have rendered the drawbacks of its mechanical change-speed-gear less pronounced. One noticeable petrol-electric system—the Fischer—was introduced exclusively for commercial work a year or two ago and its trials in this country served to show that such systems were at least practicable. It was not constructed on sound lines, however, and the scheme, which originated in America, made no headway here. From that time the petrol-electric vehicle remained quiescent until the last Paris Salon, where the Automixte system was exhibited on a touring car. This is the system which the Gearless Omnibus Company are using for their 'buses.

The Automixte and Fischer Systems.

A description of the Automixte car, which has been designed by Mons. Pieper, appeared in our issue of January 6th this year, but it may be as well in the present instance to give a brief *résumé* of its features, and compare them with those of others like the Fischer—for petrol-electric vehicles are not all built on the same plan any more than are the standard types of motor cars—before dealing with the points on which it differs, as regards its commercial aspect, from a purely electric vehicle such as the Electrobus.

There are several different types of petrol-electric systems, and among them some which employ accumulators and some which do not. Both the Fischer and the Automixte systems are in the former category, although there is a very great difference between the two in the matter of detail.

Electricity has been for so long a name to conjure with, that it is hardly surprising there should have been a preference for allowing the electric plant to preponderate in the earlier petrol-electric systems. On the Fischer vehicles, for instance, there were a dynamo, a battery, and a pair of motors; these on the Automixte 'bus resolve themselves into a battery and one motor, and yet none of the appreciable advantages of a petrol-electric system have been sacrificed. All the power of the engine was converted into electricity by the dynamo, and re-converted back again into mechanical power by the motors, in the Fischer system, whereas the Automixte 'bus has a "direct-through drive," and only transforms into electricity the surplus power for which there is no immediate need. In the working day of any motor vehicle, there are frequent and long intervals of time when the engine is quite capable of doing a little more work besides that which is required of it for propulsion, and with petrol-electric cars of the class we are considering, it is intended that this surplus energy should be used for charging a small battery of accumulators carried on board, and should therefore be available for affording increased power, when wanted.

The Accumulators.

It is because these accumulators are only for use occasionally for a few minutes at a time, and are intermittently charged and discharged, that the petrol-electric 'bus has a chance of succeeding financially where the electric 'bus, pure and simple, is sure to fail. For such conditions as these, it is necessary to use cells capable of being discharged very rapidly, and this leads to the adoption of the Planté type of battery, which has the additional advantage of being very much more durable than the pasted kind which are essential—on account of their lightness—in cases where there is no other source of power on the vehicle. Even although the power required from the battery on a petrol-electric 'bus may momentarily be nearly as great as would be required from an electric vehicle, pure and simple, yet a comparatively small Planté battery is capable of delivering that current for the short time required, without detriment to itself, and as a result there is a saving in the total weight and cost of the battery which it is necessary to carry on petrol-electric vehicles.

Details of the Automixte System.

It will be remembered, from our previous description of the Automixte car, that the engine is coupled direct to the live-rear-axle through a main clutch and propeller-shaft. Mounted on a projection of the crank-shaft, between the engine and the clutch, is an electric dynamo-motor which supplies current to, or receives it from, the accumulators according to the conditions under which the car is running at the time. A dynamo can, of course, also be used as a motor, and in this case, where it is charging accumulators, it will automatically become a motor directly its speed ceases to be sufficient to generate current at the pressure necessary to overcome the voltage of the accumulators. Thus it is that the Automixte system discards the mechanical change-speed-gear in favour of an electric equipment capable of providing the necessary variation in torque. Unlike gearless petrol cars, of which something has already been heard, the Automixte system does not rely upon an unusually powerful engine relatively to the weight of the car, but, on the contrary, it conduces to the use of a smaller engine than is now generally fitted on those vehicles which employ the customary change-speed-gear. This is not so much because the battery supplies additional power, as because the present day tendency to increase the size of engines arises more from the desire to reduce the necessity for using the change-speed-gear than because such an increase is absolutely essential for normal work. It may be pointed out here that the additional power which the battery supplies must not always be looked upon as correspondingly increasing the total power available, because it is evident that when the battery is in use, the engine will generally be running considerably below that speed at which it develops maximum horse-power.

One of the first considerations in the application of the Automixte system is the determination of the minimum useful size of the electric equipment. Obviously the power of the petrol engine itself should not be less than is normally required to propel the vehicle, because otherwise the batteries would be called upon to supply more energy than they received. Neither is there any advantage in making the engine bigger than this, because it would not then be so efficient on its average load, and the smaller electric equipment would not effectively replace the change-speed-gear.

Mr. W. Worby Beaumont, M.I.C.E.—the well-known consulting engineer—who went to Belgium in order to report upon the system, has since been entrusted with the preparation of the specifications on which the new 'buses are to be built. In his opinion, engines of 22–24-h.p. are suitable on Automixte 'buses where engines of 30–36-h.p. would have to be fitted on petrol 'buses. Some of the new vehicles, however, are to have engines of 30-h.p.—which would be equivalent to 40-h.p. on a petrol 'bus—and in such case the electric equipment is to be capable of raising the propulsive effort so that it would be equivalent to that of a 65-h.p. engine for a period of half an hour, and to 75-h.p. for five minutes. The complete vehicles have also to show themselves capable of ascending short grades of 1 in 8 at 5 m.p.h., and an incline of 1 in 11, not less than 1 mile long, at 6 m.p.h.

Bar-winding is employed on the armature of the four-pole generator-motor, which is to be capable of withstanding an overload of 80 per cent. for half an hour. It will be understood that it is desirable to have a machine which is capable of standing very great overloads, because, although as a dynamo it need not be very large, it may be called upon to stand very heavy currents when acting as a motor.

Advantages of Petrol-Electric Systems.

Among the advantages which form characteristic features of electric vehicles, some of the most important are available in this petrol-electric system. It is always possible to start the vehicle from the battery, and consequently there is no necessity to use a starting handle, and no need to stop the 'bus in the middle of traffic if the engine goes wrong. Owing to the automatic buffer action of the batteries, the engine can work under more even conditions and the drive upon the road-wheels is improved in consequence. Needless to say, too, the controller is less liable to abuse than a gear-box, and the driver may, therefore, be less skilful.

From the mechanical point of view, it is possible that an appreciable reduction in the cost of upkeep compared with that of present-day petrol vehicles might be found. There is little that needs attention in an electric motor, and assuming that it is never burnt out, it forms a very small item, indeed, in the cost of repairs. Batteries such as are used in petrol-electric systems are not a very expensive item, and their cost of upkeep need not be heavy. For a sum of £10 per vehicle per annum, the Tudor Company, who are to supply the cells, are, we understand, contracting for their proper maintenance for a term of ten years. Compared with the figures which we gave last week in connection with the Electrobus, this sum might appear ridiculously small, but these accumulators are of a totally different type, and are very much smaller than those necessarily used on electric vehicles. Their weight will be about 6 cwt., and the initial cost approximately £30.

THE ELECTROBUS FLOTATION.

ALTOGETHER there has been a very considerable amount of correspondence and discussion—to which this journal has largely contributed—in the columns of the daily Press regarding the "Electrobus" promotion. As this correspondence was evoked in the first instance by the action taken by THE AUTOMOTOR JOURNAL, we append below the various letters which we have written, and those which have appeared in other papers, on the subject, so that our readers may be provided with a complete record, and may be in a position fully to comprehend the attitude which we have taken up on the question.

The controversy commenced in the following way:—On Wednesday, April 18th, we went, by invitation, to inspect the "Electrobus" at the Hotel Cecil, where it was formally introduced to the Press with the usual ceremonies. From what we gathered on that occasion, and from the very remarkable statements that subsequently appeared in the daily papers, both in regard to electric traction generally and the merits of the electric vehicle under discussion in particular, it not only became evident that an extensive appeal to the public was likely to take place at an early date, but that public support was liable to be based on misleading statements. Having had very exceptional facilities for estimating the prospects and possibilities of electric traction as applied to 'bus locomotion, we felt it to be a duty incumbent upon us to warn the public generally against the dangers by which this particular scheme was accompanied, and before the prospectus was issued, or the public appeal on behalf of the "Electrobus" was made, we sent round to the Press, on April 21st, the following letter, which appeared, or to which reference was made, in *The Times*, *Financial Times*, *Financial News*, *Tribune*, *Morning Post*, *Daily Express*, *Daily Mirror*, and other papers:—

"SIR,—In the interests of the great and important motor industry which is now being steadily built up, and in view of the many fascinating but dangerously misleading statements that have recently appeared in the public Press, with regard to the possibilities of running electrically-propelled 'buses on a satisfactory commercial basis, it is but right that a timely warning should be given to the public on this subject. In the best interest of the public and of the automobile industry alike, we should therefore like to draw the attention of your readers to a few well-established facts, the general knowledge of which may, it is hoped, prevent any recurrence of the disastrous financial fiascos which so seriously retarded motoring development in this country a few years ago:—

1. Any electrically-propelled 'bus must essentially derive its propulsive power from a battery of accumulators that is carried upon it.
2. The battery needed for such a vehicle is of considerably larger size and is far more costly than those now employed on the electric broughams and landaulettes in London, besides being subject to very much more rapid depreciation owing to the exceptionally drastic conditions under which it must necessarily work on a 'bus.
3. The actual cost of recharging and maintaining the comparatively small battery on these light town carriages under the most favourable circumstances in London—where every advantage is taken of concentrated and collective management—is at least 6*d.* per mile run, and has only been brought down to this figure after several years of practical experience by thoroughly qualified engineers who have made a special business of this work.
4. On this basis it is obvious that the cost of accumulators (recharging and maintenance) alone must greatly exceed the entire cost of operating the petrol 'buses now in use, the generally agreed average figure for which is about 10*d.* per 'bus-mile.
5. Hitherto all attempts to utilise accumulator-propelled vehicles for public service work—even on tramlines—in this country have been financial failures, and there have since been no such radical improvements in accumulator construction as to justify a repetition of the experiment.

"I am, &c.,
"THE EDITOR, THE AUTOMOTOR JOURNAL.
"44, St. Martin's Lane, W.C.,
"21st April."

An article written by us at the special request of the *Daily Mail*, also appeared in that paper on the Wednesday, April 25th.

On Monday, April 23rd, the prospectus appeared, the promoters having evidently taken time by the forelock in a manner which we hardly anticipated, but a considerable effect had obviously been produced by our letter upon the attitude of the general Press towards the promotion, and the *Financial Times*, on Tuesday, April 24th, in particular, subjected the financial features of the prospectus to a very searching and caustic criticism. By this time, alarm had evidently been taken, as on the Tuesday, although the lists were advertised to close on the Thursday, the company commenced allotting shares to applicants, and issued the following official notification to the Press:—

"Owing to the number of applications for shares in the London Electrobus Company, Limited, having far exceeded the minimum (50,000) on which the directors had decided to go to allotment, letters of allotment were duly posted to applicants yesterday (April 24th). The underwriters were not called upon to subscribe."

In spite of the adverse criticism which had now become general, no other move than this was made by the company until after a ray of hope for the promoters appeared on Thursday, April 26th, in the form of the following letter in *The Times*:—

"*To the Editor of 'The Times.'*

"SIR,—Referring to the letter from the editor of THE AUTOMOTOR JOURNAL, it would be interesting to know from what source he has obtained his figure of 'at least 6*d.* per mile' as the cost of recharging and maintaining batteries for electric carriages.

"As far as our experience goes, from carriages garaged at our Moscow Road charging station, the cost per mile for current averages 1¼*d.*, while the maintenance of the battery, if taken at 25 per cent. per annum on a mileage of from 4,000 to 5,000 a year, does not exceed another halfpenny per mile. In our opinion, an electric car competes very favourably in cost of running with a petrol one.

"We are, Sir, your obedient servants,
"The Metropolitan Electric Supply Company, Limited,
"E. CUNLIFFE OWEN, Secretary.
"The Metropolitan Electric Supply Company,
"16, Stratford Place, W., April 24."

Mr. Owen's letter was evidently deemed to be a sufficient text upon which to base an explanation, and consequently, on the following day, Friday, April 27th, a letter was sent to the general Press by the secretary of the Electrobus Company in which it was explained that—

"In view of the unjustifiable criticisms my directors, on Tuesday, proceeded to a first allotment on the receipt of applications for over 75,000 shares received from 1,300 applicants, as they considered that this was in the interests of the general body of shareholders,"

and a copy of Mr. Owen's letter to *The Times* was enclosed by the secretary in justification of their estimates for maintenance. Mr. Owen's estimate was, however, based upon entirely wrong premises, as was pointed out in our reply addressed to *The Times*. That reply, which was also sent to the other papers in which Mr. Owen's letter had appeared, reads as follows:—

"SIR,—In reply to Mr. Cunliffe Owen's letter in your issue of the 26th instant, the figure quoted by us—the cost of recharging and maintaining the batteries on electric broughams and landaulettes—is that shown by the books of the Electromobile Company, which is the largest of the electrical vehicle concerns in London. By the courtesy of our good friend Mr. Theodore G. Chambers (the managing director), we have on more than one occasion in the past been allowed to study the extremely complete and analytically detailed records that are kept by his well-organised company, and we can, therefore, claim to be fairly conversant with this subject. With his permission, we are now able to further substantiate our statement by giving the following details as to how the figure of 6*d.* per car mile is made up:—Cost of current (including expenditure on 'power' staff and on 'charging' staff) = 1·7*d.*; cost of battery plates alone = 3·35*d.*; general battery 'stores' = ·38*d.*; labour in connection with battery repair = ·52*d.*; and clerical expenses = ·05*d.*

"This figure of 6*d.* per mile may, we think, be taken as thoroughly representing the best commercial practice at the present time, since the Electromobile Company have now had over three years' experience, and their business—which amounts to half a million car-miles per year—is, we believe, in excess of all the other electric carriage firms in London put together. It may, moreover, be added that at a conference of the Electromobile Company, the Krieger Company, and the City and Suburban Company, held about a year ago, with the object of furthering their common interests, 7*d.* per mile was the actual figure they arrived at. This figure included the relatively small cost of 'gear' depreciation, and therefore almost exactly confirms 6*d.* as being a correct statement of battery cost. With regard to Mr. Owen's suggestion that 'the maintenance of the battery, if taken at 25 per cent. per annum on a mileage of 4,000 to 5,000 a year, does not exceed another halfpenny per mile,' we can only assume that he is totally unacquainted with 'traction' batteries, and must, therefore, express our regret that the Metropolitan Electric Supply Company —a company in whose business even 'stationary' batteries do not play an important part—should have made so definite a statement in respect to a matter which is evidently entirely outside their own sphere. For traction batteries, the basis taken by the Metropolitan Electric Supply Company for maintenance is obviously absurd; it should have been nearer 150 per cent. than the suggested 25 per cent. per annum. We are only too well aware that there is a strong tendency to under-estimate the cost of accumulator traction by those who have not had an actual experience in running such a business commercially. As an instance of this, it is interesting to know that even the Electromobile Company themselves found it absolutely necessary to increase their tariff by 33⅓ per cent. after having had a year's experience.

"I am, &c.,
"THE EDITOR OF 'THE AUTOMOTOR JOURNAL.'
"44, St. Martin's Lane, W.C.,
"27th April."

It may be pointed out in passing that the manner in which Mr. Owen's letter was seized upon by the Electrobus Company, in spite of its total inadequacy to meet the objections with which it attempts to cope, is sufficient evidence that the officials of the Electrobus Company must be as ignorant of the conditions of electric traction by means of accumulators as apparently is Mr. Owen himself.

On April 28th a letter from Mr. Carl Oppermann (this letter, also addressed to us, appears in our Correspondence columns) controverting our statements, appeared in the *Financial Times* and other papers, this letter being, as will be seen (page 557) a direct contradiction of certain figures quoted by us in our original letter.

To it, we replied as follows:—

"SIR,—Comparatively little need be said in reply to Mr. Carl Oppermann's letter of the 26th inst., which appeared in your issue of Saturday last. On behalf of the whole automobile industry (petrol, steam, electric, petrol-electric, &c., &c.) which we represent, we are quite willing to investigate the workings of any commercial undertaking and to inspect any reliable figures obtained from it over a reasonable period. In other words, we challenge Mr. Oppermann to substantiate the statements made by him that 'The actual cost of maintaining and recharging a battery suitable for an electric brougham, where every advantage is taken of concentrated and collective management, should not exceed twopence per mile. I have run such batteries for a competing firm on very inefficient vehicles at twopence per mile, and with a substantial profit.' If he can prove his contention, we should be only too glad to assist him in making the fact public and to thus help him in reaping the enormous fortune that must immediately await him.

"Mr. Oppermann's suggestion that we are unduly prejudiced in favour of either petrol or any other particular system is utterly unfounded. We do, however, strongly object to the exploitation of any type of automobile on the basis of misleading commercial or financial statements.

"Yours faithfully,
"THE EDITOR OF 'THE AUTOMOTOR JOURNAL.'
"April 30."

We think that no further comment is at present needed in connection with this letter.

By way of further record, we add to this series of letters the two following, which have appeared in a number of the daily papers, and which may some day be interesting to recall:—

"DEAR SIR,—The attention of our clients, the Gratze Patents and Engineering Syndicate (Limited), of 44a, Whitfield Street, W., has been drawn to the many criticisms that have appeared in the Press respecting the upkeep, maintenance, and cost of accumulators to drive the omnibuses of the London Electrobus Company (Limited). Our clients have submitted through us a tender which we are instructed they are able financially, as well as commercially, to carry out for the supply of the accumulators, and the upkeep of same, at a price which will leave them a fair profit, and will allow the running of such omnibuses, so far as electricity is concerned, assuming that a guaranteed daily mileage is maintained to be at a price which does not exceed 3*d.* per mile.

"With regard to the assertion that, owing to the prohibitive weight of the accumulators, the omnibus cannot maintain the same speed as a petrol motor omnibus, our clients wish us to state that the objection does not apply in any way to their accumulators, which are manufactured under an improved process, which gives a far greater capacity for less weight and size than has hitherto been attained.

"As so much prominence has been given to the adverse criticisms we feel sure that you will give this letter equal publicity.

"Yours faithfully,
"KENNETH BROWN AND CO.
"11, Pancras Lane, London, E.C.,
"April 26, 1906."

The following report by Mr. Henry F. Joel, A.M.I.C.E., was sent to the shareholders of the Electrobus Company, from which the subjoined extracts were made by *The Times*:—

"As to the statement of costs, I can verify the costs of maintenance of the accumulators. I find the cost of current on a basis of 120 miles per day, and a cost of electric energy at ¾*d.* per unit (I understand the company are offered current at 0·6*d.* per unit, which is less than ¾*d.*), the cost of electric energy would be 10*s.* a day, and, if £300 per omnibus is taken as the cost and depreciation of the batteries, *i.e.*, 20*s.* per day for 300 working days, the total cost under this head would be 30*s.*, as stated in the prospectus.

"This works out at 3*d.* per omnibus mile. I believe this to be a full and reliable estimate from a large and varied experience of batteries. I have had batteries on cars used with care lasting for four years, and with care, such as the special conditions of an omnibus running a fixed route, fixed times, running back to terminal charging or changing battery stations, the cost should not exceed 3*d.* per mile run, the batteries will be constantly under supervision and test, and would never be over discharged. The conditions are altogether far more favourable, and will cost less for upkeep than an electric brougham or such as hold with the electric cabs.

"I have read the list of advantages of the electric omnibus over the petrol omnibus, and I fully endorse those advantages. The ease of starting, running, and comfort of electric vehicles are admitted, and are fully appreciated by those who have ridden in them. And I have every confidence that your electric omnibus will have a great success."

In evidence of the necessity for dealing with this Electrobus question in its initial stages, and for the further comments which we make on page 533, it may be remarked that there have already been formed six other companies, entitled the Manchester, Liverpool, Lancashire, Birmingham, Nottingham, and Provincial Electrobus Company, respectively.

INVESTIGATING A MINERS' STRIKE BY MOTOR CAR.

Making friends with the miners.

Mine mules brought to the surface for the first time since the strike of three years ago.

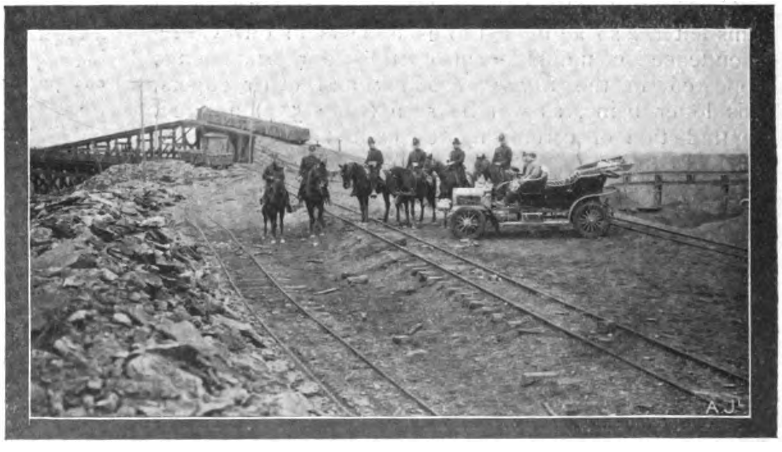
INVESTIGATING A MINERS' STRIKE ON A MOTOR CAR.

IT might be thought that no tourist would choose, as the time for an extensive tour, the first week in April, particularly if the itinerary led over the all but impassable mountain roads of eastern Pennsylvania. Yet this is exactly the trip which E. C. Johnson, of Philadelphia, and party, in a "White steamer," brought to a successful conclusion last month. The tour was through a country which in any season would be of much interest, but the tourists determined, with the aid of their motor car, to view the coal strikes in the anthracite region at close range, and as a result participated in the stirring incidents which marked the first week of the suspension of work amongst the miners.

Mr. Johnson and his companions left Philadelphia on Monday morning, April 2nd, and toured by way of Bryn Mawr to the historic camp site of Valley Forge, then through Phœnixville to Reading. Turning north and following closely the valley of the Schuylkill River, they continued through the centre of prosperous Berks County to Hamburg, a little town of some 2,500 inhabitants, which, in its marked German characteristics, is typical of most of the communities in that locality.

After spending the night at Hamburg, the tourists hastened on the next morning to Pottsville, and here left the main highway, and headed north-easterly for the heart of the coal regions, which are so abundantly supplied with railroads that no attention is paid to the roads. At least no attempt has been made so far this year to make them passable. As far as Pottsville, it should be said, the roads might be described as "fair to medium."

Before many miles had been covered out of Pottsville, evidence began to multiply that the coal regions were close at hand. Wherever there was a valley, or other natural depression, a spur of railroad had been built as a means of disposing of the "culm" which accumulates wherever anthracite mining is carried on.



INVESTIGATING A MINERS' STRIKE ON A MOTOR CAR.—
State Constabulary escorting the motor tourists.

Near Tamaqua the first collieries were seen, and from that time on the tourists were never many miles away from a mining settlement. From Tamaqua the road lay due north alongside a raging mountain torrent toward Hometown. Thence a great mountain range was crossed, and from its summit the tourists saw the towering coal-breakers of McAdoo, Audenried, and Hazelton.

On reaching this settlement, a considerable number of men were seen at work around the collieries. On being interviewed, they were careful to show their "working buttons," and to explain that they were doing only repair work and other odd jobs "allowed by the Union." A party of them were given a ride around the valley, and they undoubtedly alighted from the machine with a more friendly disposition toward the motor car than they had exhibited when the tourists first approached them.

A visit was then made to the squalid homes of the miners. Their ramshackle, unpainted houses told the story of great poverty, and the tourists could not help but sympathise with the attempt of the miners to secure increased pay. The miners in this region were mostly

Hungarians, who seemed a rather orderly lot, and who hung around in little groups apparently enjoying their few days of respite from toil.

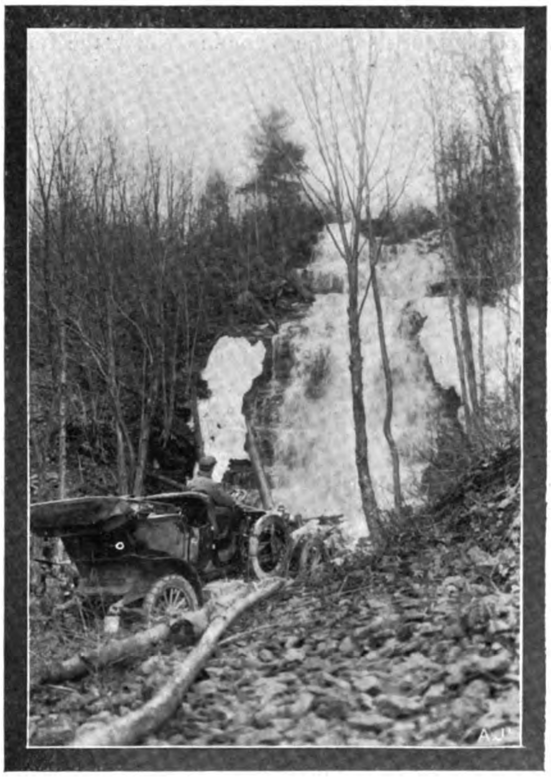
Leaving Hazleton on Wednesday morning, the route lay through the mining settlements of Harleigh, Ebervale, Jeddo, and Eckley, all of them very similar to the hamlets south of Hazleton.

One of the most exciting moments of the entire tour was the "coast" down Eckley Mountain. The tourists, without warning, found themselves on a steep road with the mountain on one side and a deep precipice on the other. The road was covered with melting snow, under which was a layer of slippery clay, and the car half skidded, half coasted down this dangerous pass, and the tourists breathed a sigh of relief when they reached the valley beyond safely.

White Haven was the next important town to be reached, and then came a ride of 15 miles to Bear Creek, during which not a single human habitation was seen. The region was very high and uninviting, and the only vegetation observable were a few hardy, stunted fir trees. However, along this piece of road there were several magnificent waterfalls, which, in a measure, compensated the tourists for the arduous going.

The route was then turned toward Wilkesbarre, and the tourists approached this town down the same road which is next month to be the scene of an important hill-climbing contest. At Wilkesbarre, in fact throughout the entire Wyoming Valley, a far different condition of affairs prevailed than around Hazleton. The mines in the Wyoming Valley are manned mostly by Italians, with a reputation for ferocity and disregard of the law. Excitement was at fever heat, and a company of the State Constabulary were patrolling the valley. This squad of men numbered only fifty. Many of them had seen service in the Spanish War, and their business-like appearance, their skill in handling their horses, and the formidable display of weapons which they carried in full view, seemed to over-awe the striking Italians, who outnumbered them almost a thousand to one.

When Mr. Johnson and his party attempted to visit the collieries in the vicinity, the strikers showed a very threatening attitude, as they jumped at the conclusion that the tourists must be on some mission in the interests of the companies owning the mines. After several undesirable experiences, the tourists thought it wise to ask the commander of the constabulary if they might accompany the troops while on patrol. This permission was granted, and in return the "White" aided the constabulary by carrying to the different mines supplies of army revolvers and ammunition.



INVESTIGATING A MINERS' STRIKE ON A MOTOR CAR.—An "obstacle" to progress in the coal regions.

A typical experience was the arrest of some Italians at the Fernwood Colliery. This colliery is situated in a lonely isolated spot several miles back from the Susquehanna River, and was from the first the centre of considerable disturbance because the company were operating

A sample of the roads passed over in eastern Pennsylvania.

Operating a "washing" with Non-Unionist labour, which resulted in rioting.

INVESTIGATING A MINERS' STRIKE ON A MOTOR CAR.

the washery with non-union men. The night before the arrival of the tourists in the Wyoming Valley, the Italians had given vent to their feelings by firing their revolvers at the colliery buildings, and the authorities feared that the next weapon to be used would be dynamite. Accordingly, a dozen or so of the constabulary were deputed to arrest certain men thought to be the ring-leaders of the strikers. The automobile went ahead into the miners' village, and was immediately surrounded by a half-curious, half-threatening mob. While they were absorbed in sizing up the tourists, the constabulary came galloping up, and, in less time than it takes to tell, had snapped the handcuffs on the men they wanted; and automobile and troops were out of the town before the miners had recovered from their surprise.

A number of the collieries visited by the tourists looked like fortifications. They were surrounded by stockades of stout timbers, surmounted by lines of barbed wire. Behind these barricades were guards, employed by the companies, whose only instructions were to "Shoot first and shoot straight." It was evident that the only thing which was preventing great riot and bloodshed was the fact that the conferences then being held in New York made it seem quite probable that work would be resumed without an extensive strike. The tourists were very well pleased that matters were as quiet as they were, and that miscellaneous shooting, which characterised the last great strike, had not yet commenced.

Two days of this sort of exciting experience was quite sufficient, and the return trip was started from Scranton on Friday afternoon about four o'clock. Local automobilists appealed to Mr. Johnson and his party not to try the return trip, because there were a dozen places which they declared were absolutely impassable. The first of these was the dreaded Scrub Oak Mountain outside of Scranton. The woman who collected toll, as the party approached the mountain, told them that no teams had been through for two days, and to get through with a heavy machine loaded with five passengers was out of the question. Her prophecy almost came true, as several times both axles were aground in the mud, despite the unusual clearance of the car. But by crowding on every available pound of steam and by "simpling" the engine, the mountain was finally crossed.

The next quagmire was encountered in the peculiar swampy promontory which lies between Daleville and Tobyhanna. On more than one occasion it seemed as if no further progress could be made, but each time the car proved equal to the task of getting through. A late supper was taken at Tobyhanna, and, as there was a magnificent moon and the night was unusually clear, it was determined to continue running.

So on went the tourists over the summit of Mount Pocono, then down its steep southern incline through Henryville to Stroudsburg, and, aided by the friendly moon, and encouraged by the knowledge that good roads lay not many miles ahead, Mr. Johnson guided his car through Saylorsburg and Wind Gap, and then to Nazareth, where an even stretch of macadamised road was found which led them to Bethlehem. Here the tourists snatched a few hours of sleep, and in the morning quickly passed over the 53 miles which separated Bethlehem from Philadelphia. They arrived here at noon, travel-stained and bronzed by the sun, but like their machine, none the worse after their eventful and rather arduous week's tour through an even dozen of the counties of eastern Pennsylvania.

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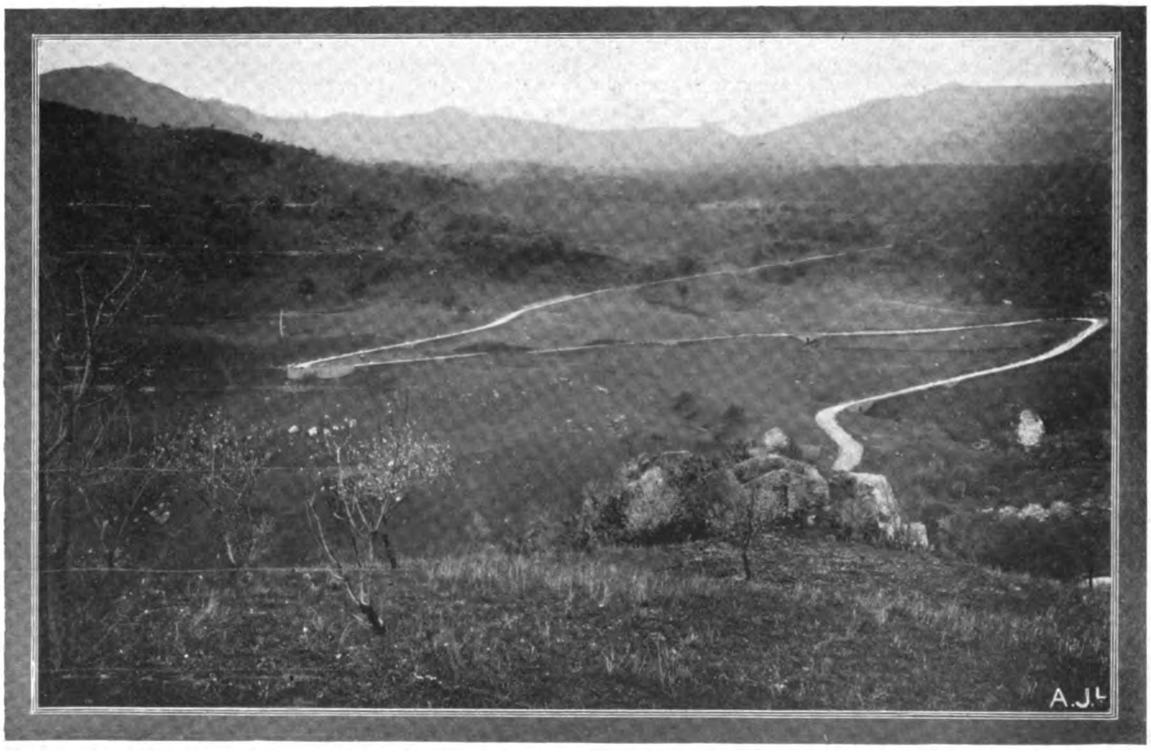


THE TARGA FLORIO RACE IN SICILY, MAY 6th.—Another specimen of the winding roads on the Sicilian Circuit. The course, upon approaching Campo-Felice.

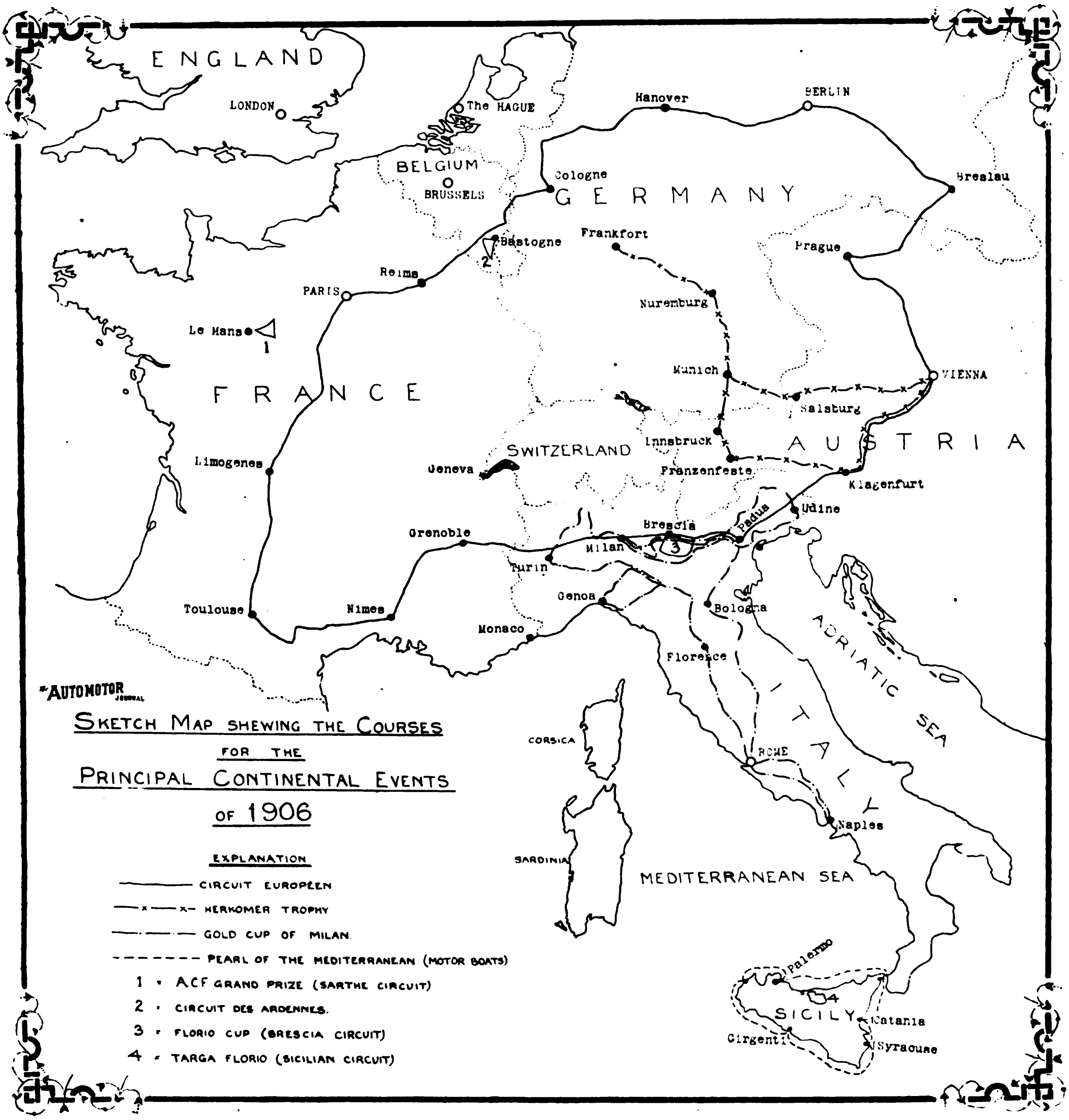
RACES, RECORDS, AND TRIALS.

Targa Florio.

For the race which is being held to-morrow (Sunday), May 6th, in Sicily, 23 cars are reported as actually being in the island ready to take their place at the starting point. These are officially announced to be as follows :—6 Italas, 2 Darracqs, 3 Fiats, 2 Bayard-Clements, 2 Radias, and one each of the following makes: Buire, Berliet, Hotchkiss, Renault, Vulpes, Mendelssohn, Zust and San Giorgio. It is also authoritatively stated that the King of Italy intends to personally witness the start. The cars will be sent off on the long straight road by the sea between Palermo and Cefalu. The circuit, of which we recently gave a sketch map, is 160 kiloms. long, and this, with all its severe gradients and intricate turnings through the mountain roads, will have to be covered three times, making a distance of 480 kiloms.

The A.C.F. Grand Prix.

Entries for this big French race are gradually creeping up, the official total now standing at 34. The latest entries include three Renault cars, three Hotchkiss, three Italas, three Fiats, three Mercedes, and two Gregoires. Entries at single fees closed on April 30th.



Sketch Map of the chief European Races and Tourist Car events for 1906. The courses comprise the eight specified in our map. These convey a clear idea of the relative length of the various contests.

Lippett's Hill Climb.

ON Saturday last a hill climbing contest was arranged by the Essex Motor Club at Lippett's Hill, High Beech, when a very large number of motorists and friends took part in a very successful gathering. No less than 48 entries were received, and the majority of these actually took part in the contest, over the half mile course. Some good times were accomplished, but, as usual, under the rules of the Automobile Club, the actual times are not permitted to be published. The meeting was an open one, and each of the three events were handicaps. For the first, for motor cycles, thirty-three entries were received, the second, for passenger motor cycles, nine entries were on the programme, and for members' cars, six entrants were down to participate. The management was in the hands of the hon. secretary, Mr. A. George Reynolds, who was, throughout the meeting, indefatigable in his efforts to ensure a successful meeting for the members. The Owl Inn, at the top of the hill, was the point of meeting, and the entrants were permitted to get up speed from a tape 25 yards from the actual starting point, after passing which line no more pedalling was permitted. The results were as follows :—

ESSEX MOTOR CLUB HILL CLIMB.—Mr. S. R. Noble, J.P., who officiated as the Marshal at the finishing end.

Motor Bicycle Handicap (Open).

1.	F. Hulbert ...	3-h.p. Triumph ...	(8 secs. allowance).
2.	R. M. Brice ...	3½-h.p. Brown ...	(scratch).
3.	H. L. Cooper ...	3-h.p. Triumph ...	(allow, 12 secs.).
4.	Stanley Webb ...	3½-h.p. Quadrant ...	(allow. 6 secs.).
5.	F. W. Applebee	3¼-h.p. Rex... ...	(allow. 20 secs.).

Owen Summers, on a 5-h.p. Vindec (allow. 3 secs.), secured the Members' Prize.

Passenger Motor Cycle Handicap.

1.	W. Hodgkinson	6-h.p J.A.P. ...	(scratch).
2.	F. Cozens ...	10-h.p. Lagonda ...	(allow. 8 secs.).
3.	F. P. O'Reilly...	4-h.p. C.I.E. ...	(allow. 5 secs.).

F. Cozens, on a 10-h.p. Lagonda (allow. 8 secs.), secured the Members' Prize in this Class.

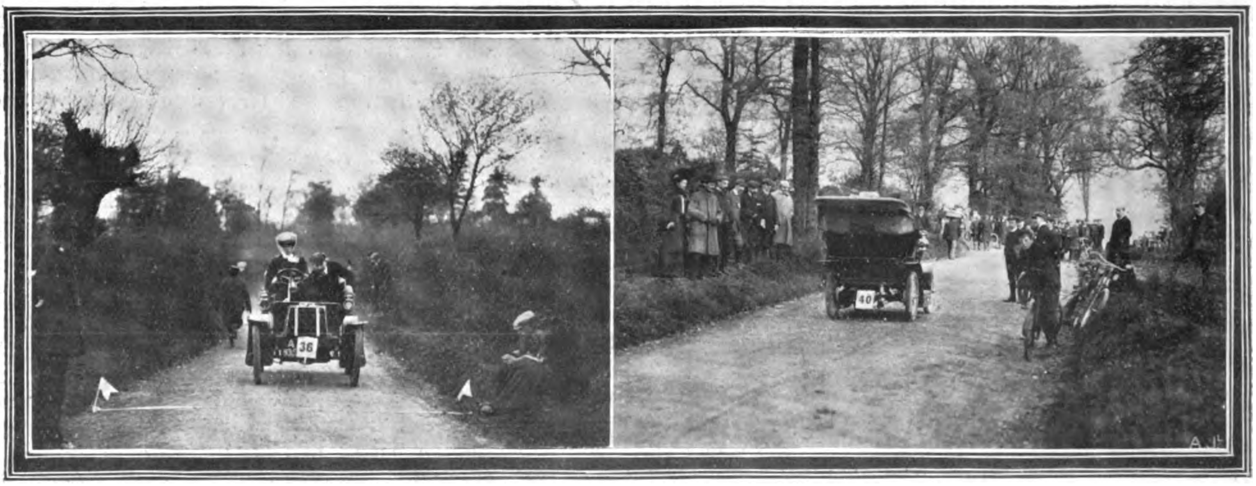
Car Handicap (Members only).

1.	E. H. Richards	7-h.p. Star	(allow. 25 secs.)
2.	Mrs. Price ...	7-h.p. Star	(allow. 25 secs.).
3.	A. Brown ...	20-22-h.p. Brown ...	(scratch).

Vanderbilt Cup, 1906.

LAST week we referred to the difficulty which had arisen in regard to the entries being made on behalf of France for French-made cars to participate in this race for 1906. The Darracqs and Lorraine - Dietrich cars, which have been notified as ready to compete, have now, it is announced, had their entries forwarded to the American Automobile Association, who have charge of the details of the race, direct. In view of the fact that the American Automobile Club have not any control over the meeting, no question can well arise in regard to the necessity for these entries to pass through the A.C. de France to the A.C. of America, as being the two officially recognised clubs of the respective countries.

ESSEX MOTOR CLUB HILL CLIMB.—Secretary A. G. Reynolds at work.



Mrs. Price, in the Car Handicap, driving the Star Car. On the right Mr. J. H. Burley, N.C.U. Timekeeper, is seen seated by the tape.

Mr. H. G. Norris' Mobile making for the top of the hill.

ESSEX MOTOR CLUB HILL CLIMB.

Lippett's Hill. Waiting for the start, looking up the course.

A. H. Elston on the 7–8-h.p. Lurquin-Condert machine, nearing the top.

ESSEX MOTOR CLUB HILL CLIMB.

South Harting Hill Climb.

ALTHOUGH correctly given in our Diary last week, the date for this event, by a printer's error, on page 497, was stated as *March* 12th instead of *May* 12th.

Racing on the Yorkshire Sands.

THE Yorkshire Automobile Club held a meeting on April 25th last, to discuss the question of speed trials for 1906. This meeting was attended by representatives from the Halifax, Huddersfield, and Cleveland branches. For some time the club has endeavoured to find an inland track suitable for high-speed racing, but up to the present time without success. Nothing definite was done at the meeting, but the sands between Saltburn and Marske-by-the-Sea, on the Yorkshire coast, were suggested as a likely venue. Messrs. Dickie and Shaw, who attended the meeting on behalf of the Cleveland branch, gave particulars of these sands. They were stated to be firm and dry, and it was possible to get a course of four miles in length, and when the tide is low there is a course width obtainable of about one-sixth of a mile. In addition to this the sand dunes on the coast would form an excellent point of vantage for spectators to view the race without unnecessarily crowding the sands. However, a deputation was formed to visit Saltburn on May 5th, with a view of ascertaining whether the sands would be capable or not for high speed motor racing.

Palermo Reliability Trials.

RESULTS are published for this trial for speed, hill-climbing, brakes, &c., as follows:—

General.—1, 24-h.p. Berliet, 317·99 points; 2, 50-h.p. Itala, 317·97 points: 3, 16-h.p. Renault, 317·06 points; 4, 24-h.p. Fiat, 316·02 points; 5, 60-h.p. Mercedes, 313·12 points.

Brakes.—1, 8-h.p. Florentia; 2, 16-h.p. Renault.

Hill-climb.—24-h.p. Fiat, 60-h.p. Mercedes, 24-h.p. C.G.V., 50-h.p. Itala, all equal.

Fuel Consumption.—1, 8-h.p. Florentia; 2, 6-h.p. Andex.

Speed.—1, 120-h.p. Mercedes; 2, 90-h.p. Mercedes.

Hill Climb at Marseilles.

A FINE performance was made by a Berliet car, on Sunday last, on the Camp Hill at Marseilles over a dis-

ESSEX MOTOR CLUB HILL CLIMB.—Some of the competitors outside the Owl Inn, Mr. A. G. Reynolds, the energetic Hon. Secretary, is in the centre of the picture in the light coat.

tance of 4 kiloms. The event was under the auspices of the Marseilles A.C., classing being by piston area. The Berliet car was in Class IV. (piston area under 530C^2), and covered the 4 kiloms. in 3m. 40⅕s., the best time of the day.

Heidelberg-Königstuhl Hill Climb.

AT the commencement of last week this hill climb, organised by the Rhenish A.C., over a distance of 7 kiloms., in which the total rise was 450 metres, was successfully carried through. 19 entries were received, the result being:—

		m.	s.	Points.
	Class I.			
1.	35-40-h.p. Benz ...	6	46	301
2.	42-h.p. Mercedes ...	7	21	254
3.	50-h.p. Hermes ...	7	35⅘	128
	Class II.			
1.	20-h.p. Benz	9	20⅖	393⅖
2.	24-h.p. Opel	10	38⅕	254⅕
3.	20-h.p. Benz	7	50⅖	248⅕
	Class III.			
1.	18-h.p. Benz	10	8⅕	355
2.	16-h.p. Metallurgique	12	21⅗	275
3.	14-h.p. Benz	14	10⅖	269⅕

ESSEX MOTOR CLUB HILL CLIMB.—W. Hodgkinson, who secured first place in the Passenger Motor Cycle Handicap, taking the running start from the first tape.

The A.C.G.B.I. 4,000 Miles Tyre Trials.

THE judges' report now issued confirms our announcement on April 21st of the award of three gold medals to the Collier Tyre Company.

Resilient Wheel Trial—Paris-Nice-Paris.

As we announced last week, this trial came to a conclusion on Thursday, April 26th. Of the four devices—the Garchey, Soleil, Ducasble, and "E. L."—which started on the return journey from Nice only two, the Soleil and the "E. L." arrived at Paris. Originally there were ten competitors, so that the result cannot be considered as wholly satisfactory to the makers of resilient wheels.

For the full distance of 2,152 kiloms. the two cars fitted with the "E. L." and Soleil wheels took 72h. 13m. 44s. and 91h. 51m. 26s., respectively, this being equivalent to an average speed of 29·8 kiloms. per hour for the "E. L.," and 23·4 kiloms. per hour in the case of the Soleil. After hearing the report, the judges made awards to the Soleil and "E. L." devices, and also to the Garchey, for they considered that although the car actually broke down yet the performance of the wheels was worthy of full recognition.

Atlantic City Race Meeting.

AT a motor meet at Atlantic City, held April 26th to 28th, the 110-h.p. Christie racing car appears to have at last given a good account of itself. On the second day, Walter Christie, driving this machine, is reported, during preliminary trials, to have covered the mile in 35⅕ secs. (previous record 38 secs.), against Guy Vaughan's 39 secs. on an 80-h.p. Darracq.

Brighton Speed Course Litigation.

MR. SHOESMITH's case against the Brighton Corporation, in which he sought to have their payments of £2,500 and £500 for Tarmac-ing the Madeira Walk for the speed trials disallowed on the ground of these payments being illegal and unnecessary, was decided on Monday last in Mr. Shoesmith's favour, and against the Brighton Corporation.

AERONAUTICS.

To the North Pole by Airship.

MR. WELLMAN has arrived in England from the United States *en route* for Paris, where he is going to supervise the construction of the airship which has been so frequently referred to, and described in our columns, with which he intends attempting to reach the North Pole. He has been wished every success by President Roosevelt in an autograph letter. Mr. Wellman anticipates reaching the Pole in 25 days, but it must be borne in mind that no airship, or even balloon, has ever kept the air for anything like that period.

Captain Scott on Polar Ballooning.

APROPOS of the question of reaching the Pole by navigable balloon, the experiences of Capt. Scott, who was in command of the celebrated Antarctic expedition, do not suggest the likelihood of success being attained by gas-bag airships in Polar exploration. He took a balloon with him and ascended to a height of 1,000 feet, the balloon being held captive, his object being to obtain a view over the great ice barrier which surrounds the Antarctic continent. This he accomplished, and observed land in the distance, but his experiences are not encouraging in regard to ballooning. Considering the trouble of taking out the gas (in compressed form), and the difficulties involved, he does not advise the use of balloons in Antarctic regions. These difficulties will by no means be less in the case of a navigable balloon.

Sir Hiram Maxim on Aeroplanes.

A PAPER was read before the same meeting on the experiments with flying or gliding machines of the Brothers Wright by Sir Hiram Maxim, whose success, he declared, deserved hearty congratulation. Sir Hiram proceeded to describe some of his own early experiments, on which he stated that he expended as much as £20,000.

Milan Competition.

THE date at which the Milan aeronautical tests commence was postponed from April 29th to May 3rd.

CLUBS AND ASSOCIATIONS.

Inter-Club Meet.

ON Saturday a combined club run to Ashby-de-la-Zouch took place, members of the Nottingham, Derbyshire, Leicester, Northants, and Midland clubs joining. Altogether about seventy cars were counted at the Royal Hotel, one and all reporting weird experiences in driving through the violent hail storms which swept the country on that day. Amongst those present were Mr. E. G. Mawbey (president of the Leicester A.C.), Mr. Alan McAlpin (secretary), Captain Byron, Mr. E. Kennard (Market Harborough), Mr. A. Aveling (Midland Club), Mr. Booth Grainger (Nottingham), Mr. C. J. Allin (hon. sec. Derbyshire Club), Mr. T. H. Ryland (hon. sec. Midland Club), Mr. E. M. C. Instone, &c.

Irish A.C.

THE Earl of Aberdeen, Lord Lieutenant of Ireland, on Monday last, formally opened the new club house and motor house of the Irish A.C. in Dawson Street, Dublin. A goodly gathering of members were present to support Sir W. G. D. Goff, Bart., the chairman of the club, in receiving the Lord Lieutenant.

Kensington A.C.

THE meeting of automobilists living in Kensington, held at the Royal Palace Hotel on Thursday last week, under the auspices of the Motor Union, was well attended. After some remarks by Mr. Rees Jeffreys, secretary of the Union, it was unanimously decided to form "The Kensington Automobile Club" and to join the Motor Union. A code of rules was adopted, the annual subscription was fixed at one guinea, and it was agreed that ladies should be eligible for membership. A strong committee was elected, consisting of Dr. L. C. Dobson (chairman), Drs. W. S. Cox, V. A. L. E. Corbould, and W. H. O. Copeland, Messrs. W. H. Thompson, W. Forster, L. A. Bidwell, E. F. Philbrick, and T. C. Owen. The hon. treasurer is Mr. M. de Selincourt. The hon. secretary is Mr. J. Horace Reeves, of 6, Penywern Road, Earl's Court, S.W., who will be pleased to answer all inquiries concerning the club. Already close on thirty members have been enrolled, including two ladies, and other names are to hand to place before the committee. Hence, despite the propinquity to Piccadilly, it is clear that there is room for a local club with a modest subscription and the Kensington Automobile Club is therefore likely to be in for a very successful career.

Nottinghamshire A.C.

A VERY pleasant outing took place recently of members of the club to one of the old-world inns, which it is the main object of the new Road Club to resuscitate. Upon this occasion, "Ye Olde Bell" Hotel at Barnby Moor was selected—a picturesque old building of interesting historic reminiscences. The occasion was in response to the invitation of Mr. R. Denys Dundas, the manager, who is also associated with the Road Club. About 34 cars joined in the run, amongst the earliest arrivals being Mr. Booth Grainger, the hon. secretary; and Mr. Charles Hardy, of Bulwell Hall, the president of the Notts Club. Dating back to the old coaching days, "Ye Olde Bell" is probably one of the most picturesque inns to be found in that part of the country. Soon after the decline of the popularity of the Great North Road, consequent upon the introduction of railways, it was converted into a private residence. Automobilism has now been the means of once more bringing into use the old coaching roads, and consequently this charming old hostelry has again, after many years, been given over to its original purpose. The house has been furnished with perfect taste and judgment, and will no doubt materially help the cause of the new Road Club. May the rest of their selections for head-quarters be equally fortunate.

Scottish A.C.

HAVING regard to the matter of dust-raising and other considerations, the committee of the club have again resolved that, with the exception of the anniversary run in October, organised club runs will not be held. Places are named only as suggested rendezvous or the objective of member's Saturday outings during the summer months.

The opening meet was at Callander on Saturday last.

Society of Motor Manufacturers and Traders.

AT the meeting of the Committee of Management of the Society last week, Mr. T. Clarkson (Clarkson's, Limited, Chelmsford) was elected hon. treasurer for the year. Amongst a mass of other matters considered was the petrol supply question and the road question, the latter in connection with the conference convened by the London Chamber of Commerce, in which in addition to the Society (as the representative society of motor industry) there are affiliated the Automobile Club, the Motor Union, the Roads Improvement Association and Farmers' Club, and the Motor and Cycle Engineers' Institute.

The Society is forming a library, and already numerous offers of volumes have been received from members.

With reference to the April, 1907, Exhibition, the committee had before them and dealt with recommendations from the committees of the two sections interested, viz., the Commercial Vehicle section and the Marine Motor section, so that the forms in connection with this show can shortly be issued.

In view of the admirable manner in which the traffic at the last Olympia Exhibition was again controlled by the police, the Society has decided to repeat their donation of £20 to the Metropolitan and City Police Orphanage.

The Tyre and Accessory section has taken a very useful step in the standardization of lamp brackets for side and tail lamps. A standard has been agreed on for recommendation to the members of the Society. This will be of great benefit to users and the trade alike.

South Herts A.C.

THE programme for the club during the present month opens with a run to Dunstable to-day, Saturday. On the 12th the club will join in the open 150 miles' non-stop run of the Essex Motor Club, and on the 19th a week-end run is arranged to Clacton-on-Sea. On June 9th a closed hill climb in Herts will take place.

South Wales A.C.

UPON the occasion of the first annual dinner of the club, which was held at the Royal Hotel, Cardiff, last week, in the absence of the president, the Earl of Plymouth, through indisposition, Capt. Hughes Morgan, one of the vice-presidents, occupied the chair. A very influential gathering of members and friends was present, numbering about sixty people, and including Mr. J. A. Jones, President of the Cardiff Chamber of Commerce; Mr. Wm. McKenzie, the Head Constable; Principal Griffiths, Councillors Lewis Morgan, J. W. Courtis, and J. T. Richards; Mr. J. Thompson Willows (vice-president and hon. secretary of the club), Mr. W. Wood-Davey, Mr. F. C. Shackel, Mr. Wm. Graham, Mr. W. Rees Jeffreys, and Mr. E. M. C. Instone.

In proposing the toast of the "City of Cardiff, and its trade," Principal Griffiths spoke of the good relations existing between motorists and the city authorities, mainly through the good offices of their very esteemed friend, the Head Constable.

Mr. Rees Jeffreys, in responding to the toast of the Motor Union, mentioned that the Motor Union, in conjunction with the Roads Improvement Association, was approaching the President of the Local Government Board with reference to the dust nuisance. They held the view that, as the roads were increasingly used by through traffic in contra-distinction to local traffic, a larger portion of this cost should be borne by Imperial funds. Local authorities should have some assistance from the State in adapting roads to the conditions of modern traffic, and the State could very properly experiment, and advise local authorities of the best and cheapest methods of providing dustless roads. The Motor Union and the Roads Improvement Association were experimenting, and were prepared to find money for this purpose, and if the clubs would co-operate with them something might be done. From many sources, from motorists and those who did not motor, he had received complaints of the roads in Carmarthenshire. The Union had engaged an expert engineer to go over the roads, had received his report, and had placed all the facts before Mr. Danckwertz, K.C., asking him to advise them what means they had of inducing the authority responsible for the main roads of Carmarthenshire to carry out its duties in a more efficient manner. They hoped, with the co-operation of local automobilists, to do something from which every-one present would receive substantial benefit.

The chairman, responding to the toast of the South Wales and Monmouthshire A.C., complimented the members upon the energy of their secretary, Mr. Willows, to whom the high position of their club was, he considered, entirely due. Referring to the Automobile Club driving certificates, he regarded the chauffeurs' certificates as an excellent institution, as they would debar drivers, who had no regard for ordinary road traffic, from obtaining service with motorists. He held strong views on the dust question and on the subject of police traps, and considered that on a straight piece of road, where there was no other traffic, an automobile should be allowed to go as hard as it liked. Whenever a danger-post asked one to go at 8 or 10 miles per hour the request should be observed, and any automobilist who fell into a police trap in that prohibited distance had no one to blame but himself. The money, he contended, which was raised by the taxation of motor cars should be spent in experiments on the dust question. In Breconshire, the council was most willing to meet motorists in regard to roads, and they had instructed the surveyor to experiment with different kinds of stone. If the clubs would combine with the Motor Union by bringing pressure to bear on the different councils, they might be able to do a lot of good.

The Head Constable, Mr. Wm. McKenzie, in reply to the toast of the Guests, congratulated the motorists of that part of the country on the way in which they drove. In regard to the speed limit, he thought Section 9 of the Motor Car Act was a perfect farce. The Act would be very much stronger without it, as every provision was made in Section 1 to provide against reckless and dangerous driving. He thought a man was quite justified when the road was perfectly clear in letting his car go.

Wolverhampton A.C.

AMONGST the fixtures for the coming season of this club are, on May 26th, Petrol Consumption Trial, in a run to Hereford (126 miles), a Hill-Climbing Competition on July 2nd, a Gymkhana and Appearance Competition on August 18th, and Reliability Trials on September 15th, when the destination will be Cheltenham, a distance of 112 miles.

Yorkshire A.C.

ON Saturday last the club held their first meet, when some 130 members participated in a very successful outing to Harrogate. The chairman, Mr. E. H. Hepper and Mrs. Hepper entertained the members and friends to afternoon tea at the Hotel Majestic.

The following members have been elected to the club: Messrs. S. McFarlane (Leeds), F. Roper (Leeds), W. H. Hanson (Barnsley), and Sidney Girling (London). It has been decided to join the Manchester Automobile Club in an inter-club meet at the Empire Hotel, Buxton, on 23rd June.

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MOTOR CYCLING.

Motor Cycle Record Beaten. Barnes Covers 54 Miles 1,620 Yards in the Hour.

TIMED by Mr. A. V. Ebblewhite, at the Canning Town track on Monday evening, G. Barnes succeeded in beating the one hour motor cycle record by about eleven hundred yards. That he did not add still further to the distance was due solely to the failing light, which necessitated his slackening speed considerably towards the finish. Indeed, an expert on the ground considered that otherwise he would have covered 58 miles in the hour. He made a standing start, and first got inside record at 28 miles, covered in 30m. $24\frac{2}{5}$s., as against the previous best of 30m. $57\frac{2}{5}$s.

From that point he beat the previous figures up to the time of his stopping, and covered 54 miles 1,620 yards in the hour, as against C. R. Collier's 54 miles 523 yards. The last-mentioned record was made on July 12th last year, but Collier's records up to 28 miles were made in the match against Barnes on the 16th of last month (April). Barnes on Monday used a twin-cylinder Alcyon of 8 h.p. The old and new records are as follows:—

	G. Barnes.		C. R. Collier.	
Miles.	m.	s.	m.	s.
28	30	$24\frac{2}{5}$	30	$57\frac{2}{5}$
30	32	$33\frac{4}{5}$	33	$8\frac{2}{5}$
35	37	$56\frac{3}{5}$	38	$36\frac{3}{5}$
40	43	$21\frac{1}{5}$	44	7
45	48	$49\frac{1}{5}$	49	$41\frac{4}{5}$
50	54	22	55	$16\frac{1}{5}$

Distance covered in one hour, 54 miles 1,620 yards.

COMMERCIAL POINTS.

THAT enterprising paper—the *Newcastle Chronicle*—is using pneumatic tyres on its motor delivery vans. They are the well-known Palmer cord tyres and, we understand, have been in use for about 11 months, doing an average of 30 miles per day.

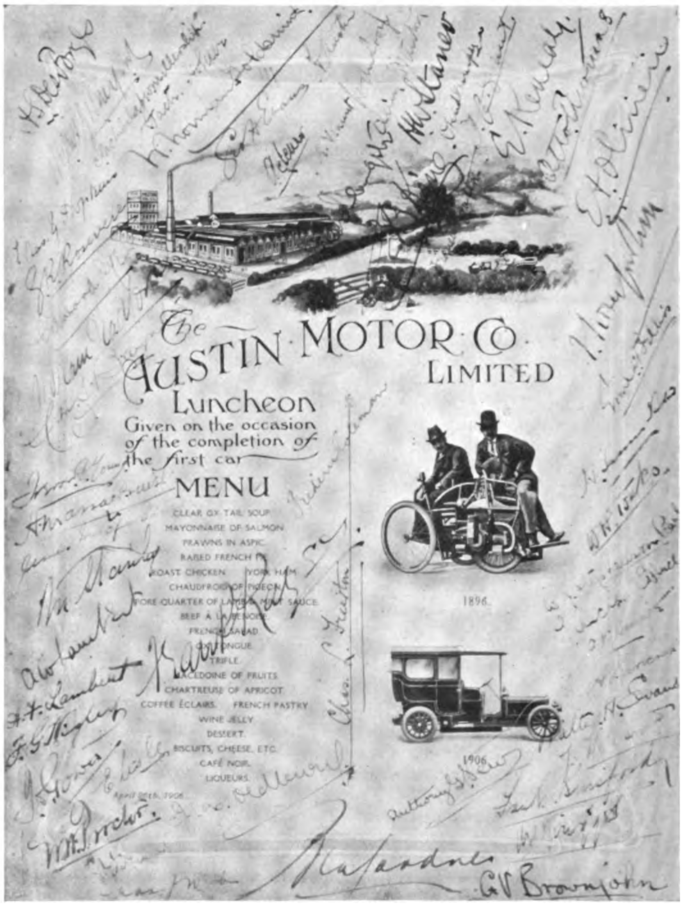
A CONTRACT to supply a motor tower wagon for tramway purposes to the Halifax Corporation, has just been secured by Messrs. Legros and Knowles, Ltd., of Cumberland Park, Willesden Junction. This order was secured by tender in competition with a large number of firms and before the order was placed the Iris works and vehicles were very carefully inspected by the engineer of the Halifax Corporation. The tower wagon will be mounted on the well-known Iris light commercial vehicle chassis specially adapted for this purpose.

THE Ladies' Automobile Club have selected the Wolseley Motor Garage, York Street, Westminster, as their official garage. The Motor Union had previously fixed upon this enormous garage which is close to the headquarters of the Union at St. Ermine's Hotel.

THE Great Western Railway, writing to the Sirdar Rubber Company, state that they are obtaining quite satisfactory results from Sirdar tyres at the present time. The front tyre on one of the Company's cars running at Slough has now, they state, run over 16,000 miles.

An Invitation to Motorists.

FREE tyre repairs are not easily obtained, and many motorists will therefore feel inclined to avail themselves of Messrs. Harvey Frost and Co.'s latest offer, which is that they will repair *free* any motor tube which is taken to the firm's West-End showrooms, 215, Shaftesbury Avenue (New Oxford Street end), and repair it under the observation of its owner. The offer is made with the purpose of acquainting some motorists with the H.-F. process of tyre repairing, who may not have had an opportunity of witnessing it previously. The repaired tube may be taken away and practically tested at the motorist's convenience, and if satisfied with the work performed he can have a "Car" Vulcanizer on loan for ten days to experiment with himself, and with option of purchase.



The Austin Motor Co. Limited

Luncheon

Given on the occasion of the completion of the first car

MENU

CLEAR OX TAIL SOUP
MAYONNAISE OF SALMON
PRAWNS IN ASPIC
RAISED FRENCH PIE
ROAST CHICKEN YORK HAM
CHAUDFROID OF PIGEON
FORE QUARTER OF LAMB & MINT SAUCE
BEEF A LA [illegible]
FRENCH SALAD
OX TONGUE
TRIFLE
MACEDOINE OF FRUITS
CHARTREUSE OF APRICOT
COFFEE ÉCLAIRS. FRENCH PASTRY
WINE JELLY
DESSERT.
BISCUITS, CHEESE, ETC.
CAFÉ NOIR.
LIQUEURS.

April 26th, 1906.

1896.

1906.

G V Brownjohn

An interesting memento of the "christening" of the first Austin Car.—The menu card of the "christening" luncheon at the Longbridge Works, Northfield, on April 26th. The signatures of those present were collected on two menus for Mr. H. Austin and Capt. Kayser respectively.

Auto Cycle Club Quarterly Trial.

TWENTY-SEVEN entries were received for the second quarterly trial which took place on Wednesday, April 25th. Twenty-three of these turned up at the start, which took place from the Chequers Hotel, Uxbridge. The route, which lay through Beaconsfield, Dashwood Hill, and Islip to Banbury, returning *via* Aylesbury and Chesham, was 125 miles in length. The following is a record of the performance of each machine which had finished before 8 p.m. :—

No.	Machine.	Rider.	Stops.	Hill Climbing.
	h.p.			
2	2¾ Minerva	G. Henderson ...	1[1]	Slowly ; pedalled near top.
3	3½ Brown ...	R. M. Brice ...	N.S.	Very fast.
5	3 Triumph ...	F. Hulbert ...	N.S.	Very good.
6	3½ Clyde ...	J. Shaw	N.S.	Fair ; pedalled.
7	4 Werner ...	O. C. Godfrey ...	N.S.	Very good.
8	3¼ Rex ...	F. W. Applebee	N.S.	Slow ; pedalled.
13	3½ Quadrant	L. W. Bellenger	N.S.	Fast.
14	4 Werner ...	E. W. Ashworth	N.S.	Fair ; pedalled near top.
15	2¾ Kerry ...	G. Aldington ...	1[2]	Inlet pipe not properly screwed up.
16	5½ G.B. ...	F. E. Cox ...	1[3]	Very fast.
		Tricars.		
17	10 Invicta ...	W. B. Barnes ...	N.S.	Good ; 2nd speed.
18	9 Riley ...	G. Vandervelde	N.S.	Good ; 2nd speed.
19	9 Singer ...	Bert Holland ...	N.S.	Good ; 2nd speed.
20	6 Riley ...	A. Carpmael ...	N.S.	Fair.
21	10 Lagonda	M. Stuart ...	N.S.	Very good ; 2nd speed.
22	6 Invicta ...	E. C. Porter ...	1[4]	Good.
24	10 Armadale	A. C. Godwin-Smith	3[5]	Stopped on hill.
25	4½ Armadale	K. Batchelor ...	2[6]	Good.
26	9 Riley ...	J. Browning ...	N.S.	Very good.

Causes of stoppages, excluding punctures :— [1] Broken belt. [2] Failed on Dashwood. [3] Broken belt. [4] Clutch slipping. [5] Loose terminals and leaky radiator. [6] Petrol turned off: oil pipe union loose.

* * *

CORRESPONDENCE.

⁂ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

ELECTRICITY OR PETROL.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As one of the pioneers of the electric carriage industry in this country, may I be allowed the privilege of availing myself of your valuable space in replying to the letter from you which appeared in the *Financial Times* on this interesting subject.

At the outset I may point out that the first paragraph in the letter clearly shows the standpoint from which you view the subject, viz., as a possible competitor to the petrol vehicle industry. But because reckless statements have recently been made as to the probable cost of maintaining and running an electric 'bus, this is no excuse for equally reckless and unsubstantiated statements to be made regarding the upkeep of a battery of accumulators for an electric landaulette or brougham, which in your letter is put down at 6*d.* per mile run.

The actual cost of maintaining and recharging a battery suitable for an electric brougham "where every advantage is taken of concentrated and collective management," should not exceed 2*d.* per mile. I have run such batteries for a competing firm on very inefficient vehicles at 2*d.* a mile and with a substantial profit.

What the actual cost of the upkeep of the petrol 'bus really is remains to be proved.

That the boom is good for the manufacturers is patent to everyone, but whether the petrol 'bus is to prove a boon to the shareholders remains to be seen.

As to the statements that hitherto all attempts to use electric accumulators even on tram lines have failed in this country—I do not know of any such attempt during the last ten years—and considering how little the accumulator has been understood and the vast improvements made during this period in the details of their construction, I see no reason why not only should tramcars be propelled by their own batteries, but that even a 'bus propelled by the same means could be run with at least as much profit as its petrol competitor, and most certainly in both cases to the greater comfort in every conceivable way to the community at large.

The way in which many of the petrol 'buses are run is, in my opinion, disgraceful, the daily increasing noise and smell will become intolerable, and I am confident that the electric 'bus will be hailed with delight by the population of this great city.

That the public would hail with delight the advent of the electric 'bus goes without saying, but whether the manufacturers of the petrol 'bus would be equally enthusiastic is another story.

I remain, sir, yours very truly,
CARL OPPERMANN.

The Electric Works,
Underhill Street, Camden Town, N.W.
April 26th, 1906.

[We refer to this letter on page 547, and therein issue a direct challenge to Mr. Oppermann to prove his statements with regard to the commercial cost of battery upkeep.—ED.]

THE DUST PROBLEM—SOME PRACTICAL PROPOSALS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The inconvenience and the dangers which have been endured this Easter as a result of the manner in which our roads are made are only a foretaste of what will be suffered by the general public during the summer months. The well-being of the population, therefore, demands that very immediate and practical steps should be taken to encourage the local authorities to build the main roads of this country of dustless materials.

Unless the State takes some active steps to encourage the local authorities in the construction of dustless roads there is no doubt that very little progress will be made in this matter.

The Roads Improvement Association are approaching the President of the Local Government Board on the question. They have asked Mr. John Burns to receive a deputation which, among other things, will urge :—

1. That the Local Government Board prepare a return of the steps that have so far been taken by highway authorities to construct roads of dustless materials.
2. That the engineering inspectors of the Board investigate these experiments, and issue a report for the guidance of local authorities dealing with the results so far secured, and giving such guidance as may be possible as to methods of construction, degree of dustlessness secured, durability of materials, and comparative cost.
3. That the local authorities be encouraged to contribute towards the cost of certain experiments with dustless materials about to be made by the Association, and that the Local Government Board appoint a representative to act upon the committee which has charge of these experiments.
4. That the Local Government Board represent to the Chancellor of the Exchequer and the Government the desirability of giving effect to the recommendation of the Royal Commission on Local Taxation (Lord Balfour's Commission)—a recommendation subsequently endorsed by the Departmental Committee on Highways appointed by the Board—that a further contribution of one million sterling should be made annually towards the cost of the maintenance of main roads and that that grant should be accompanied by conditions calculated to secure efficient maintenance.
5. That the Board promote legislation empowering county authorities to fix a minimum width for all trunk roads.

In its attempts to deal with the dust problem on the above practical lines, the Association venture to ask for your powerful support.

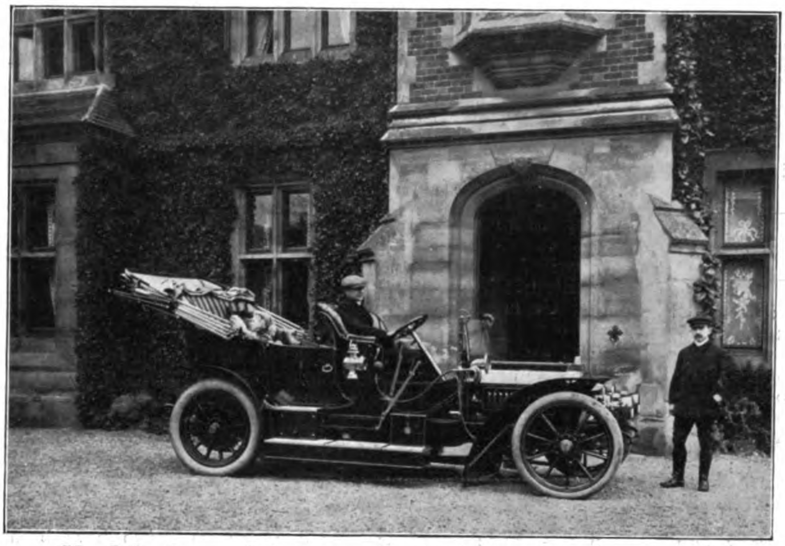
I am, Sir, yours faithfully,
W. REES JEFFREYS,
Honorary Secretary,
Roads Improvement Association, Incorporated.
April 25th, 1906.

* * *

LAW REPORTS.

Scottish Motor Traction Co. (Ltd.), *v.* Motor Car Emporium (Ltd.).

MR. JUSTICE WALTON, in the King's Bench Division, on April 26th, gave judgment for the plaintiffs in an action raised by the Scottish Motor Traction Co. (Ltd.), Edinburgh, against the Motor Car Emporium (Ltd.), to recover £665, balance of a deposit paid upon a contract for five motor omnibuses, with damages or penalty for failure to supply omnibuses according to specification.



Mr. J. L. Cross, of Bolton, on his 22-28-h.p. 1906 Crossley Car.

Cause and Effect.

As a result of the fatal accident on Good Friday at the Cobham cross roads, four danger signs are to be erected, by order of the Surrey County Council, at the respective approaches.

A Warning.

A CORRESPONDENT writes as follows under date of April 30th:—"On Saturday afternoon I found a police trap on the London side of the Bath Road on the straight stretch of about three-quarters of a mile, just before reaching the Great Western Railway bridge, between Taplow and Maidenhead. A policeman in uniform is stationed in a side road, and two plain clothes men hide behind the hedge. I am informed that the trap was also operating on Friday. As this district is served by the notorious Beaconsfield police, I would ask you to warn your motoring readers to drive with more than ordinary caution when approaching Maidenhead from Slough."

Lightning Transactions.

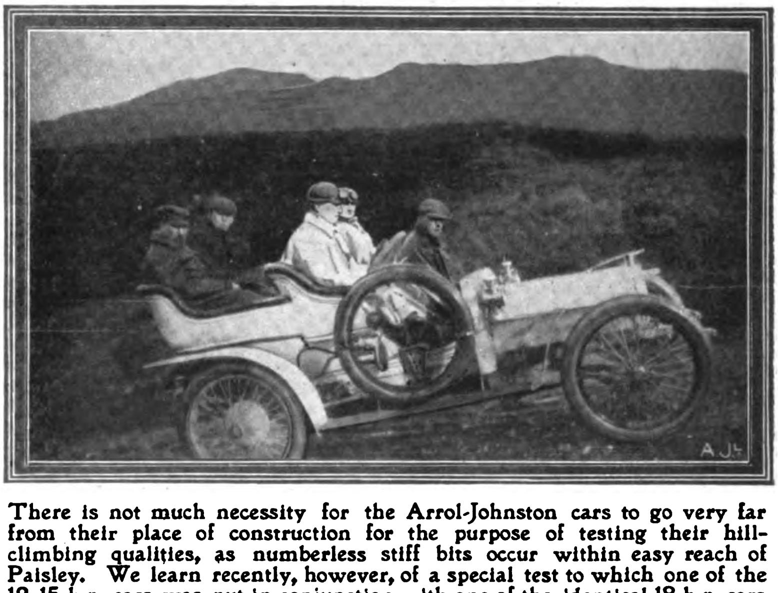
A REMARKABLY rapid second-hand transaction took place, we learn, in the Motor House one day last week. An owner drove up a small 2-cylinder car, and brought it into the sale room for advice. While waiting, he took a fancy to a Clement car, and making an offer of £100 and the car he had just driven in as a deal, it was closed upon by the management. Proceeding to the counting house he effected a settlement, but returned in about twenty minutes to find his Clement standing in the street ready to be driven away, and the car he had brought in sold, after a short trial run, to a customer who had entered on his heels. The whole affair did not last thirty minutes, and is a remarkable illustration of the market there is for reliable second-hand cars at the present time.

A Conviction for Drunkenness.

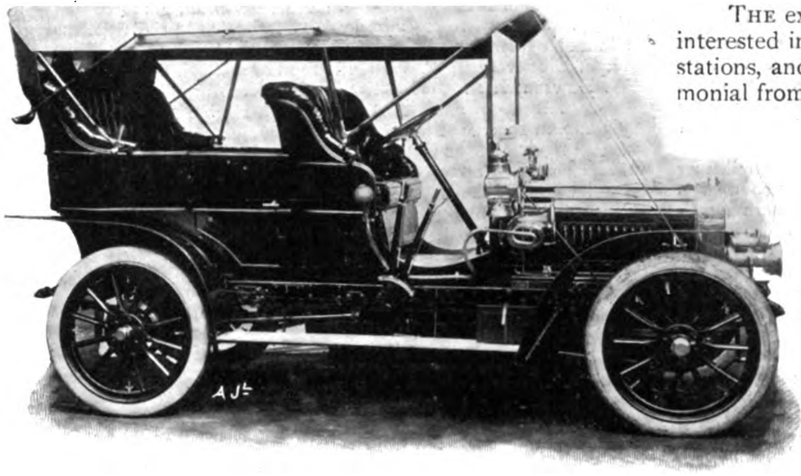
THE chauffeur to whose case we referred last week who, under the influence of liquor, drove a car on to the pavement, and behaved in such a manner when a policeman was attempting to stop his performances as to result in considerable injury to the unfortunate constable, was again brought before Mr. Paul Taylor at Marylebone Police Court at the end of last week, and fined £20 for driving recklessly and 40*s*. on the charge of drunkenness, with the alternative of two months' hard labour. This exemplary punishment will, we trust, have the effect of encouraging all persons in charge of motor vehicles to keep absolutely sober while driving them. Probably the worst crime that any driver of a car can commit is to permit himself to become so fuddled with alcohol when in charge of it as to endanger the lives and well-being of innocent people.

Happy Llandudno.

MR. W. M. LETTS, who has recently been holiday making at Llandudno, is quite delighted with the manner in which motorists are treated in that district, cases brought against them in the local police court being considered with strict impartiality, and the Corporation of Llandudno interesting itself very specially in satisfactory road maintenance in the district. They have even brought strong pressure on the County Council to keep the roads as they ought to be kept.



There is not much necessity for the Arrol-Johnston cars to go very far from their place of construction for the purpose of testing their hill-climbing qualities, as numberless stiff bits occur within easy reach of Paisley. We learn recently, however, of a special test to which one of the 12-15-h.p. cars was put in conjunction with one of the identical 18-h.p. cars which ran on behalf of the Arrol-Johnston firm in the Tourist Trophy last year. The spot selected was the ascent of Loch Striven Head, and our photograph shows the 12-15-h.p. car at the stiffest part of the hill. This car carried four passengers, whilst the 18-h.p. car which was driven by Mr. John S. Napier had five on board. Careful tests, with a gradometer, showed the worst gradients to be 1 in 3¾, near the summit, 1 in 4½, and 1 in 4¾, the average being about 1 in 5. The performance is all the more creditable as the surface of the road was very bad. One of the passengers who made the ascent was Mr. R. J. Smith, the Hon. General Secretary of the Scottish Automobile Club.



A 16-20-h.p. 4-cylinder Swift Car, which has just been completed for Mr. James Taylor, M.P., of Helsby, Cheshire.

Desaix on a Motor Trolley.

A COLOSSAL statue has been made of the celebrated French General of the first Republic and Consulate in Napoleon's days, who, with Kellermann and his cavalry, saved the battle of Marengo, and has been designed for his native town of Riom. The statue weighs five tons, and has been transported to its final resting place on an automobile trolley.

The Motor Academy.

RECENTLY a successful demonstration of the new Era Fire Extinguisher was held, by permission of Mr. Smith, on the premises of the Motor Academy—the large driving school which was opened last November, and to which we referred in our issue of November 11th. We noticed on the occasion of our visit that the class rooms at this institution have been particularly well equipped with models, and there is strong evidence that the managers responsible are making every endeavour to make the Academy fulfil by its reputation the promise which it held out at its inauguration six months ago. Besides being the scene of the fire extinguishing experiments it was selected by the A.C.G.B.I. as the trial ground for the non-skid tests of the Hedgeland axle.

The Taxameter.

"IT will deprive the cab driver of his freedom and turn him into a wage-earning servant," is what Mr. Fred Hill, the secretary of the Cab Drivers' Union, says about the taxameter. We have argued the subject in the past in favour of its use for some length, so we can only add that we do not see that the loss of freedom in the sense meant, particularly if the words "of language" be added after freedom, would be at all likely to diminish the wage-earning capacity of cabmen. After all, the position of a wage-earning servant is one which, provided the wages are good enough, many people endure with fortitude and equanimity.

An Evidence of Railway Interest.

THE extent to which railway companies are becoming interested in the motor 'bus, for feeding their outlying stations, and in automobilism generally, receives a testimonial from the fact that our contemporary, the *Tramway and Railway World*, has recently commenced publishing a supplement, entitled "Motor Traffic," which is entirely devoted to automobilism.

Ladies' Toilettes and the Motor 'Bus.

COMPLAINTS are finding their way into the daily Press from ladies who maintain that their dresses are often seriously injured by the amount of oil which motor vehicles, especially 'buses, deposit at their stopping places. Should motor 'bus traffic have the effect of somewhat diminishing the present exuberance of skirts, it might, perhaps, be not altogether a public misfortune, but at the same time it must be admitted that a little more care in the management of their lubrication would get rid of what threatens to become, in some places, a decided nuisance. It is not merely the ladies' "frocks" which suffer, but in certain places the surface of the road, particularly where it is asphalte or wood paving, becomes at times decidedly slippery.

Combating Police Motor Traps.

THE Talbot red confetti device is obtaining an amount of commendable imitation, as several different sets of operators were evidently at work during the Easter recess, the result being that the police bag all over the country was naturally woefully disappointing when one considers the summer weather and the comparatively fine condition of the roads. Mr. C. R. Garrard discovered a trap between Slough and Maidenhead, and curious to see if motorists were readers of the motor Press to an extent which would make them understand the danger signal, he drove his car up a lane and sat down to watch the effect of the police trap. In the course of half an hour three drivers came along, and each one immediately throttled down on perceiving the warning paper. Highly satisfied, he set out for fresh fields to conquer, and discovered another trap on the Wickham-Oxford Road, where he found an unfortunate victim in the toils of the police.

The first of the 1906 Tourist Trophy Cars, which will run in the Isle of Man Race in September next. The car is a 20-h.p. Rolls-Royce, with the Hon. C. S. Rolls at the wheel.

NEW ISSUE.

Belsize Motors, Ltd.

THE company has been formed, the prospectus states, to acquire from the Belsize Motor Car and Engineering Company, Ltd., its undertaking, works, plant, &c., stock-in-trade, designs, book debts and other assets, and to undertake all its liabilities. The vendor company, whose registered office is situate at Belsize Works, Clayton, Manchester, are the makers of the famous Belsize cars, which deservedly rank amongst the finest cars, either English or foreign, now on the market. The orders on the vendor company's books at the present time are considerably larger than at any previous period. The benefit of these and of the contracts with the various agents will be taken over by this company. Mr. Hoyle Smith, the managing director, states that from his knowledge of the actual production of the Belsize Works on the present capital employed therein he is satisfied that with the increased capital to be obtained from the present issue the production of the works can be doubled. The net profits for the year ended 30th July, 1904, were £1,468, and the dividend paid 5 per cent. per annum; for the year ended 30th July, 1905, £2,811, and the dividend 6 per cent. per annum; and for the eight months ended 24th March, 1906, £4,978. The profits earned during the latter period, with the balance of profits brought forward, are more than sufficient to pay a dividend at the rate of 27 per cent. per annum on the capital for the time being paid up. The sales for the year 1905 show an increase of 60 per cent. on those of 1904, and the sales for the eight months ended 24th March, 1906, show an increase of over 300 per cent. on the corresponding eight months of 1905. Applications are invited at par for 60,669 shares of £1 each.

NEW COMPANIES REGISTERED.

Alliance Motor 'Bus Co. (Ltd.)—Capital, £200,000 in £1 shares. Objects, to carry on business indicated in the title, and to adopt an agreement with Motor Enterprises (Ltd.). First directors, H. F. Clutterbucke, F. W. Kerr, the Hon. G. E. Hill-Trevor, H. W. Dawson, J. A. McCandlish, and S. K. Albright.

Armes Motors (Ltd.), 115, High Holborn, W.C.—Capital, £5,000, in 1s. shares.

Belsize Motors (Ltd.), Belsize Works, Clayton Lane, Clayton, Manchester.—Capital, £150,000 in £1 shares. Object, to acquire the business of the Belsize Motor Car and Engineering Co. (Ltd.) (incorporated in 1903). First directors, G. P. Dawson, J. Barber, G. Higginbotham, J. Whitehead, J. H. Smith, and C. Mather.

Clacton-on-Sea Motor Omnibus Co. (Ltd.), Avenue Chambers, Clacton-on-Sea. — Capital, £15,000 (£1). First directors, C. H. Miller, J. T. Lock, H. Smith, and H. G. Bright.

Forced Lubrication Co. (Ltd.), 21, John Street, Adelphi, W.C.—Capital, £3,000 in £1 shares. Object, to acquire from E. Tilston inventions relating to lubricating bearings, &c. First directors, G. H. Dorrell, F. M. S. Lewin, and W. H. Moberly.

Gilletts (Ltd.).—Capital, £5,000 in £1 shares (3,500 preference). Object, to acquire the business of cycle and motor manufacturers, &c., carried on by E. Gillett and G. Sparks.

Helis Cell and Accumulator Co. (Ltd.), 12, New Oxford Street, W.C.—Capital £1,000 in £1 shares (666 preference). First directors, J. T. Szek and H. Hunt.

Maltby's Motor Works and Garage (Ltd.), Bank Chambers, 27, Sandgate Road, Folkestone, Kent.—Capital £15,000, in £1 shares. First directors, G. Spurgen, H. J. Mason, J. H. Maltby, and S. Penfold.

◆ ◆ ◆ ◆

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

10520. 19th May, 1905. Improvements relating to Variable Driving Mechanism for Motor Cars. Charles E. Simms, 29, Showell Green Lane, Sparkhill, Birmingham. This invention relates to variable driving mechanism for motor cars, and comprises the combination with epicyclic gear of brake or control devices. There are five figures Fig. 1 is a sectional elevation. The driving and driven shafts, *a* and *b*, are placed in alignment with each other, and the end of one may have a bearing within or upon the adjoining end of the other. The driving-shaft, *a*, has secured upon it three sun wheels or pinions, *c*, *d*, *e*, engaging corresponding sets of planetary wheels or pinions *f*, *g*, *h*. The planets, *f*, engaging the first sun wheel or pinion, *c*, or that through which the high speed or direct drive is transmitted, are mounted on a carrier or rotatable part, *i*, forming one element of a clutch. The internally-toothed ring, *j*, with which the planets, as *f*, also engage, forms, or is formed with, the other clutch element. For the direct or high-speed drive the two clutch elements, *i*, *j*, whose meeting surfaces are preferably coned, are put into engagement. The inner member of the clutch, with which is the annular rack, *j*, is attached to, and so forms a part of, the cage or carrier, *k*, secured to the driven shaft, *b*. The cage, *k* (of which *j* forms a part), carries the set of planets, as *g*, to gear with the central or sun wheel, *d*, and the annular rack, *l*, freely mounted on *k*. Such train of gear constitutes the low-speed drive. The cage, *k*, also carries the set of bevel planets, *h*, to gear with the sun or bevel-wheel, *e*, keyed to the driving-shaft, and with the smaller bevel-wheel, *m*, keyed to the brake-ring or drum, *m*', and mounted freely on the driven shaft, *b*. Such train of gear constitutes the intermediate speed drive. The outer portions of the clutch elements, *i*, and of the annular rack, *l*, are made to serve as friction brakes for hinged brake straps or segments, as *n*.—April 11th, 1906.

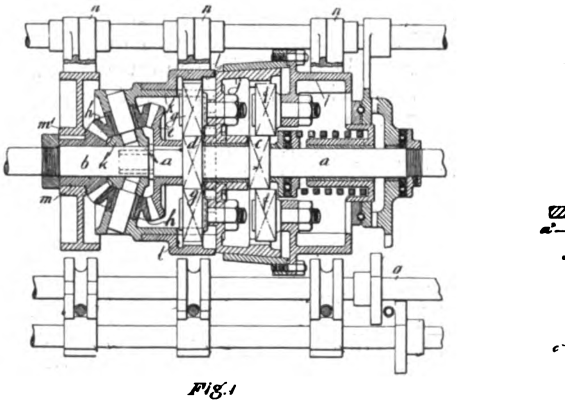
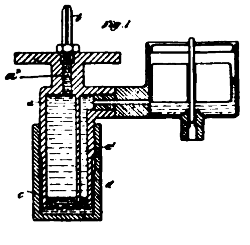


Fig. 1

8656. 22nd April, 1905. Improvements relating to Internal Combustion Engines. William H. Barrett, 29, Park Crescent, Southport, and Charles C. Cardell, 29 Crosby Road, Birkdale, Southport. This invention relates to carburetting apparatus for internal combustion engines of the kind in which mercury is employed in regulating the flow of hydro-carbon, and has for its object to provide an efficient means of maintaining at the nipple or jet in the carburettor a constant level of petrol or other liquid hydro-carbon and of adjusting the level, the feed of the petrol or other hydro-carbon being thereby controlled. There are three figures. Fig. 1 is a vertical section. A vessel or receptacle, *a*, contains mercury or other heavy liquid into which there is extended a tubular chamber or conduit, a^1, in communication with the source of supply of the petrol. A nozzle, *b*, is fitted to the vessel or receptacle, *a*. The vessel or receptacle is provided with means for effecting the adjustment of the mercury, *c*, such as a screw. The adjustment of the height of the mercury is obtained by screwing the cup or cap, *d*, more or less upon the vessel or receptacle, *a*. At each suction or inlet stroke of the engine a flow of petrol or other hydro-carbon is induced through the vessel, *a*, the suction effect being such as to overcome the resistance to such flow offered by the head of mercury, *c*, in the vessel or receptacle, *a*. The mercury thus acts in the manner of a valve in the chamber or conduit allowing a limited quantity of petrol or other hydro-carbon to bubble or find a passage through the mercury in the vessel or receptacle, the height or head of the mercury thereby acting to regulate or control the feed of the petrol or other hydro-carbon. During the suction stroke of the engine, the petrol in the vessel, *a*, is drawn up through the nipple or jet, *b*, and consequently the small amount of mercury in the tubular conduit or chamber, a^1, is displaced, the petrol passing from the conduit, a^1, into the vessel, *a*. On the cessation of the suction stroke, the mercury, in regaining its level, draws the petrol from the nipple or jet to a point in the passage a^x, which point can be determined by experiment by adjusting the level of the mercury during the working of the motor by means of the cap.—April 11th 1906,



Patent Specifications Published.

Applied for in 1905

Published May 3rd, 1906.

7,243. H. J. PEERS. Pneumatic wheels.
7,554. G. H. WOODROFFE Motor cars.
7,601. M. KENNEDY. Signalling device for indicating alteration of speed.
7,697. F. W. SCHROEDER. Change-speed-gear.
7,904. B. H. THWAITE. Apparatus for automatically sustaining the suction influence in suction gas producers.
8,680. J. P. BOURKE. Suppressing dust.
15,432. F. H. DE VEULLE. Sparking plugs.
16,289. W. J. LLOYD AND W. PRIEST. Driving and reversing mechanism.
25,920. C. PERNOT. Change-speed-gear.
26,552. A. PRATT. Exhaust silencers.

Applied for in 1906.

Published April 19th, 1906.

4,458, H. C. BRASIER. Driving gear for motor boats.

Published April 26th, 1906.

1,053. J. W. CANN. Securing twin rubber tyres to wheels.

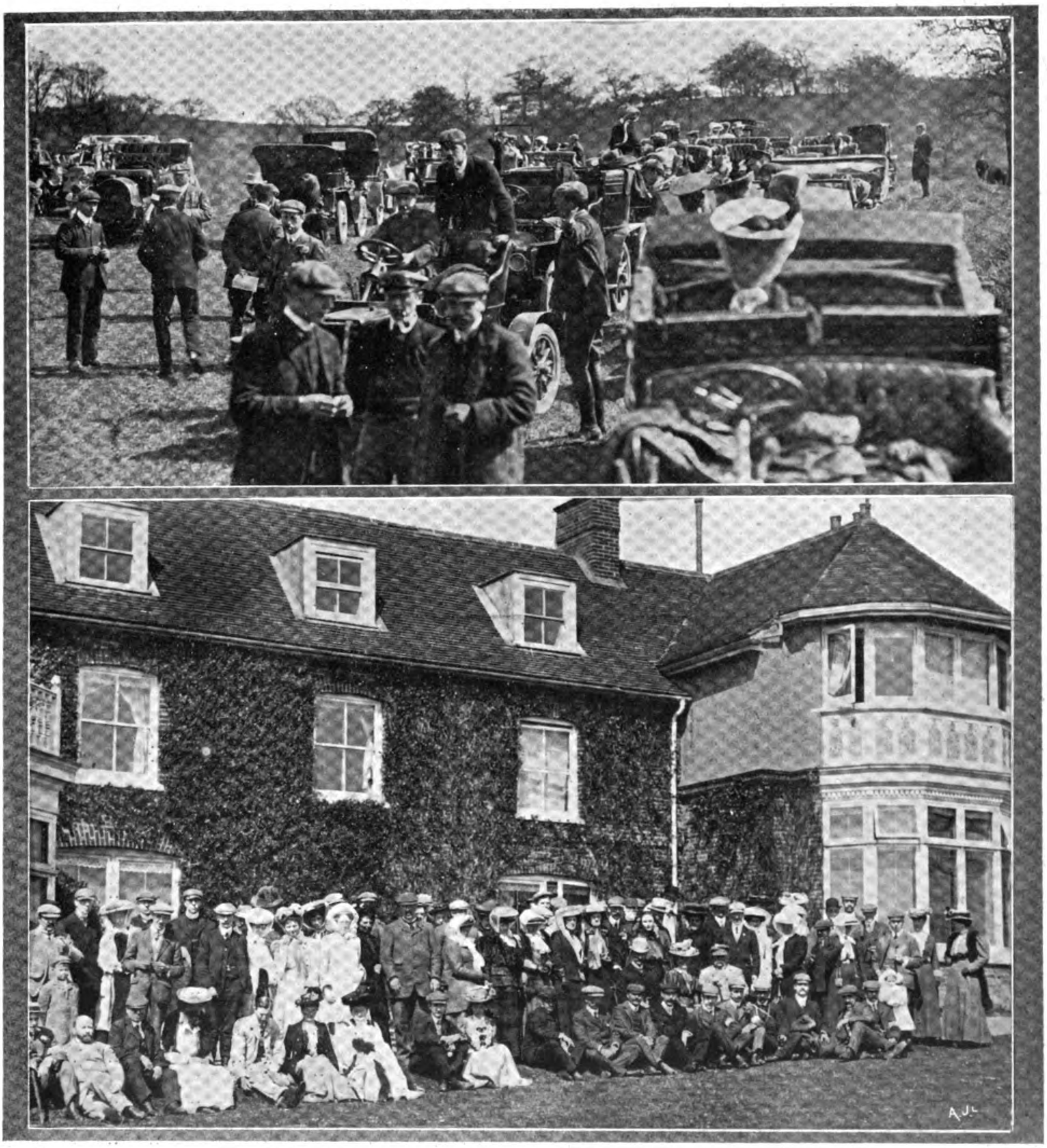
Published May 3rd, 1906.

995. L. AND T. GAUTREAU. Vaporisers.
1,590. J. DYKES and others. Variable speed driving gear.
3,761. M. SIZAIRE and others. Friction clutch.

The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

No. 279. (No. 19, Vol. XI.) MAY 12TH, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.



ESSEX COUNTY AUTOMOBILE CLUB.—First competitors' meeting of the Essex County Club, at Laindon Hills. The Club enclosure with the cars waiting to start is seen in our top picture, and in the lower photograph the members and friends as the guests of Sir Joseph and Lady Dimsdale are grouped in front of their hosts' residence, Goldsmith House. Lady Dimsdale, with Sir Joseph standing immediately behind, is seated in the second row towards the right On her left is Mr. Burnett Tarbrum (the president), and on her right is Col. W. Nevill Tufnell, who acted as judge.

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

British Events.

May 12	...	Open 150 Miles Non-Stop Run (Essex M.C.).
May 24	...	Frome's Hill Climb (Herefordshire A.C.).
May 26	...	Motor Union Meeting (Birmingham).
May 26	...	Petrol Consumption Trials (Wolverhampton A.C.).
June 9	...	Hill-Climb (S. Herts A.C.).
June 11-16	...	Land's End to John O'Groat's (Auto Cycle Club).
June 13-16	...	Scottish Reliability Trial.
June 13-16	...	Irish Reliability Trials (Irish A.C.).
June 23	...	South Harting Hill Climb.
June 30	...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July	...	Motor Yacht Club Reliability Trials.
July 2	...	Hill Climb (Wolverhampton A.C.).
July 14	...	"Henry Edmunds" Hill Climb.
July 21	...	Motor Union Meeting (Bath).
Aug.	...	*Van Trials.
Aug. 6-18	...	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8	...	International Cup (Motor Boats) Eliminating Race.
Aug. 9	...	International Cup (Motor Boat) Race at Ryde.
Sept. 22	...	Motor Union Meeting (York).
Sept. 27	...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

May 12-24	...	Tour de France (Motor Cycles and Voiturettes).
May 14-31	...	Milan Reliability Trial.
May 27	...	Motor Bicycle Championship (Moto Club de France).
June 4	...	Rochet-Schneider Cup (Auvergne Circuit).
June 6-13	...	Herkomer Cup.
June 17	...	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26-27	...	Grand Prix (A.C. de F.).
June 28-29	...	Kiel Motor Boat Races.
July 8	...	Motor Bicycle International Cup Race (Austria).
July 14-17	...	Ostende Meeting.
July 15	...	Mont Cenis Climb (Turin A.C.).
July 26-Aug. 15		Circuit Européen.
Aug. 13	...	Ardennes Circuit.
Aug. 18	...	Coupe de Liedekerke (Belgium A.C.).
Aug. 26-Sept. 2		Brescia Week (Italian A.C.).
Sept. 10	...	Florio Cup Race (Italy).
Sept. 15-16	...	Mont Ventoux Hill-Climb.
Sept. 20	...	Lake Major Motor Boat Races.
Oct. 5-14	...	Leipzig Exhibition.
Oct. 6	...	Vanderbilt Cup Race.

* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

The Smoke Nuisance—Is the Onus on the Driver or the Owner?

The case brought before the magistrate at the Tower Bridge Police Court, to which we referred last week as being adjourned, and as one of considerable interest, has now been decided by Mr. Cecil Chapman in what may be regarded as the drivers' favour, and as against the motor 'bus companies. Seven summonses were taken out against the London Motor Omnibus Company under the Highway and Locomotives Act, 1878, for emitting smoke. The company, as will be remembered, raised the defence that the motors were the best that could be devised, and that the smoke nuisance arose through the drivers' negligence in not regulating the lubrication with sufficient care. In giving his decision, Mr. Chapman said that the question raised was whether the words "consuming as far as practicable their own smoke" were intended to cover the case of negligence by a servant. He came to the conclusion that the words were intended to cover every sort of failure to consume smoke except such as were attributable to temporary causes. Evidence had been given that the engines could be run without smoke, but there was no doubt that as a matter of actual fact smoke was emitted. He came to the conclusion that the Legislature intended that the owners should be the persons aimed at, both as being more responsible and more easily identified, as also because the owner, if he wished to claim exemption, could have the actual offender charged before the court. Mr. Chapman accordingly convicted in one case, inflicting a fine of 40*s.* and 23*s.* costs. As, however, he consented to state a case, he allowed the other six to stand over until the matter had finally been decided by a higher tribunal.

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How to Mitigate the Nuisance.

Whatever the ultimate legal decision may be, however, there is no doubt that the amount of smoky exhaust, which motor omnibuses but too frequently diffuse, is often a serious nuisance and is responsible mainly for the prejudice the petrol 'bus has created in the minds of many Londoners. Certain forms of construction, particularly those in which splash lubrication is employed, are more likely to produce the nuisance than others in which the oil required for lubricating the piston is applied on a different system. It should be a matter of serious consideration for motor 'bus designers and builders to so arrange the lubricating system that there is no inducement for the owners or drivers to make sure of being on the right side by flooding the engine.

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Vive le Gymkhana, a bas le Club Run!

Even in the early and enthusiastic days of motoring, there were a good many people to whom the advantages of the club run, at any rate in dusty weather, were not particularly obvious. Many such preferred to go for runs by themselves, in which they were only troubled with their own dust, rather than to form part of an extended cavalcade in which, unless they led the line, they but too often partook freely of the dust raised by others. About the opinion of the general public, there has never been any doubt at all, and we have many a time and oft in the columns of THE AUTOMOTOR JOURNAL drawn attention to the amount of friction thus caused, and to the greater merits of the gymkhana, as an institution that might with great advantage be cultivated by local clubs in preference. The Motor Union is therefore thoroughly well advised in appealing to all its affiliated clubs to relegate their club runs to a position among the excellent institutions of the past which have done their duty, and to confine themselves for the entertainment of their members to the much more amusing gymkhana, which can by no possibility produce any irritating influence upon the general public. In fact, the public usually enjoy seeing gymkhana, particularly as the cars engaged in a gymkhana usually carry out their evolutions in a field. Only on their way to the tilting ground are they likely to raise much dust. With thoughtful consideration, therefore, the Union further points out that the local clubs would do well to induce their members to proceed separately and as far as possible by different routes to the scene of the festivities. As an inducement to the affiliated clubs to develop the gymkhana and give up the club run, the Union is allotting medals to be competed for in these events, on the recommendation of the committee of any local club which organises them.

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Dust Question and the London Chamber of Commerce.

The Engineering Section of the London Chamber of Commerce, on which were represented the Automobile Club, the Society of Motor Manufacturers and Traders, the Motor Union, the Roads Improvement Association, the Motor Van and Wagon Users' Association, and the Automobile Mutual Protection Association, recently passed the following resolution:—

> "That in view of this representative Conference of Road Users' convened by the London Chamber of Commerce, the time has now arrived when, in order to secure more efficient and economical maintenance of main roads, the State should establish a Central Highway Department which should administer a Government grant in aid of the maintenance of the trunk highways."

The Chamber of Commerce, in fact, has come to recognise that the dust question will never be satisfactorily tackled until improvement in the methods employed in making up roads from the start has been generally adopted. To carry out this effectively, a central authority for road management analogous to the French Government Department, "Des Ponts et Chaussées," is regarded by the Chamber as essential, and they point out that the usual objections urged against this proposal that roads are entirely maintained by local rates is quite incorrect. It will thus be observed that the engineering section of the London Chamber of Commerce is entirely in accord with the Roads Improvement Association, and we would suggest that solid co-operation between the two bodies (supported as they would be by the Automobile Club and the Motor Union) could scarcely fail to be effective in forwarding a cause practically everyone has at heart.

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Not all our Colonies Motor Eldorados.

Things are not always what they seem. They are usually a great deal further from being what they are represented to be. This is, in general, particularly the case when any country is represented as a place to "get rich quick" in. Canada, at any rate, as far as the motor industry is concerned, certainly does not appear at present to be a very happy hunting ground for the British exporter. At least this is the opinion of Mr. Ernest Arnott, who invaded that colony some time ago with the object of opening up an automobile market there. Mr. Arnott complains that a very false impression has been disseminated by the English Press regarding the business aspects of the colony, its whole population, as he points out, being only about the same as that of London, and the motor trade being by no means extensive or easy to capture. In general, too, the roads are shocking, apparently nearly as bad as those in the United States, and in some places quite, though the neighbourhood of Montreal seems to be an exception, and for six months in the year at any rate they are quite impassable. Those manufacturers who are determined to export cars to Canada, if they will be guided by Mr. Arnott's experience, should accordingly build vehicles of very special strength. But assuming his diagnosis of the situation to be correct, we do not anticipate that exporters will exactly jostle one another to get their automobiles into Canada—at any rate just at present.

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The Spirit of the Age.

"The untutored Indian," in spite of the prosaic influences to which he has for so long been subjected, still seems to prefer the happy knack of grasping what is often the real significance of phenomena. He gets to "kokoro," the expressive Japanese word for the heart of things, as popularised in Europe by Lafcadio Hearn. Acting on this impulse, he has given much cause for perturbation to missionaries by insisting on "worshipping" the automobile on its appearance in the Empire as the incarnation of the "spirit of the age." It is an excellent notion. Surely if the spirit of the age is incorporated and concisely expressed in anything, it is in the automobile. There is speed, mechanical genius, and compactness. It constitutes, in fact, the triumph of the application of scientific principles to practical purposes, and if that is not the spirit of the age, one may well ask what is? As regards the worship which scandalises the missionaries, that of course is another matter, though it may be pointed out for their consolation that worship with the Indian and the Oriental generally does not mean quite the same thing as with the prosaic European. Before beginning his daily toil, the Indian peasant salutes or, according to the missionaries, "worships" his plough. It is a mere recognition of its capabilities. Doubtless, the worship of which the motor car has been the subject is much the same kind of thing. After all, the "untutored Indian" has, in his day, worshipped objects less worthy of his devotion. Native policemen, at any rate, are not likely to organise police traps in India if the natives in general regard the new locomotion with such profound and reverential awe!

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Too Much Motor 'Bus.

The prophets who prophesy misfortune have never been popular, and from Cassandra onwards they have seldom been much listened to, but we feel it once again our duty to strike a warning note regarding the rush of capital into a certain class of automobile undertaking which is characteristic of the present moment, and which, far from showing any sign of diminution or termination, is going on more merrily, we might almost say more recklessly, than when we commented on the situation some months ago. The public has got into its head at last that there is an enormous future before the automobile industry, and in this opinion it is unquestionably perfectly right. Yet it does not follow as a necessary consequence that every company associated with an automobile undertaking that appeals to the public is going to prove an outlying province of Eldorado. It is the lack of discrimination displayed by investors that is, perhaps, the most serious factor in the situation. For the public has put a vast amount of money into concerns which are largely overcapitalised. Out of millions invested in motor enterprises during recent months, upwards of half has fallen to the share of London motor omnibus undertakings, and yet neither is the whole of this money fairly represented by a corresponding number of vehicles in actual working, nor has it always been possible to obtain the best types of 'buses with it. It must be recognised that though the best types of motor 'bus are doing wonderfully well, and have surprised everybody by their capabilities, the loss that will result from the depreciation of inferior vehicles will be certainly enormous. Further than this, nobody really yet knows what the earning capacity will ultimately prove to be, or to what extent wear and tear combined with premature superannuation will affect the figure of running cost during the next few years. In fact there is trouble ahead if irresponsible motor 'bus promotion is not speedily checked. It would be impossible for anyone to believe more firmly in the prospects of the motor 'bus than we do, but it would be foolish to ignore the facts which we have just mentioned or to pretend that they do not demand comment, owing to the presence of that undesirable company-promoting element which is always accompanied by gross overcapitalisation. Existing manufacturing concerns, as they appeal for further capital, are quite capable of supplying those who desire to participate in the harvest that the motor car is bringing with it with a sufficiently safe and ample field, provided that reasonable discrimination is duly exercised.

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The Royal Commission.

The Royal Commission on the Motor Car Acts, over which Viscount Selby is presiding, has now, it is announced, practically completed the taking of evidence, and is proceeding to the preparation of its report. This important document, the appearance of which will be awaited both by motorists and their adversaries with almost equal impatience, is not expected to appear for some time—possibly a considerable time—after Whitsuntide. It will probably be of an epoch-making character, as it is doubtless destined to form the basis of future legislation on the question, and is to cover the working of the Motor Car Acts, the injury to the roads which it is alleged motor cars occasion, a review of the law and practice relating to motor cars in the principal foreign countries, and whether any additional taxation of automobiles is to be recommended.

An Object Lesson.

When electric trams are laid down in a district which is at all thronged with traffic, the dislocation of ordinary locomotion, usually lasting for months, is terrific, and seriously affects business over large areas, but we have not yet heard that any of the sufferers have been compensated. A shocking object lesson in what at times occurs may at present be studied in the neighbourhood of Vauxhall. Here the curious may observe not merely the ordinary chaos, which renders an important road impassable, but may note that quite large areas of gas and water pipes have had to be taken up and relaid deeper for the accommodation of the tram conduits.

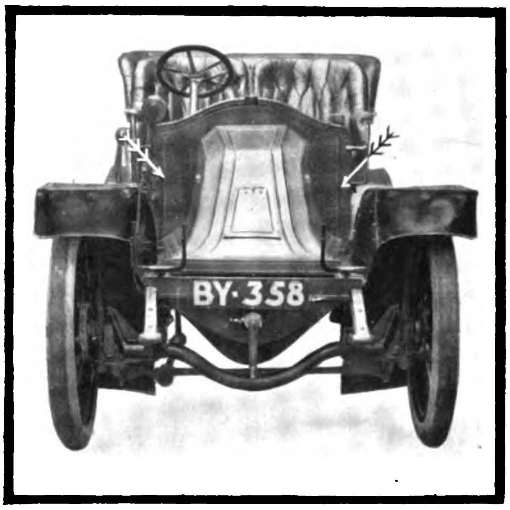
How to Recognise the Cars of To-day.

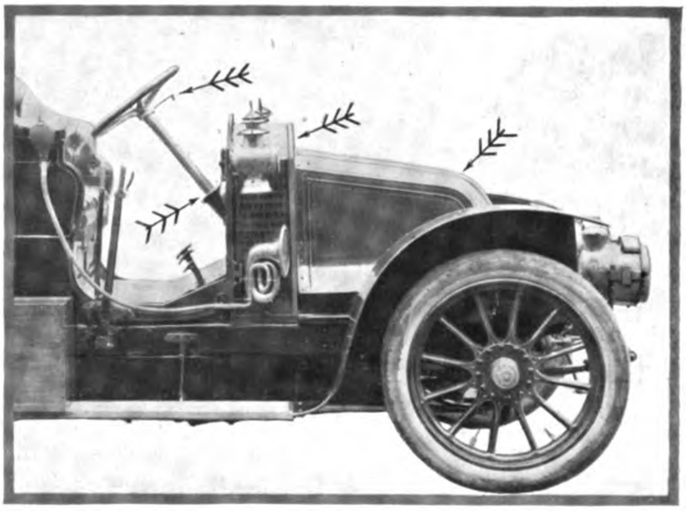
(No. 27).

The Renault

(FRENCH)

8, 10, 14, 20 & 35 H.P.





These Live-Axle cars are peculiar in having the RADIATOR BEHIND THE SLOPING BONNET. The Bonnet by itself is not entirely distinctive, although it differs from those on most present day cars. Other characteristic details are the STEERING COLUMN, which passes through the Dash, and the long horizontal THROTTLE LEVER BELOW THE STEERING WHEEL

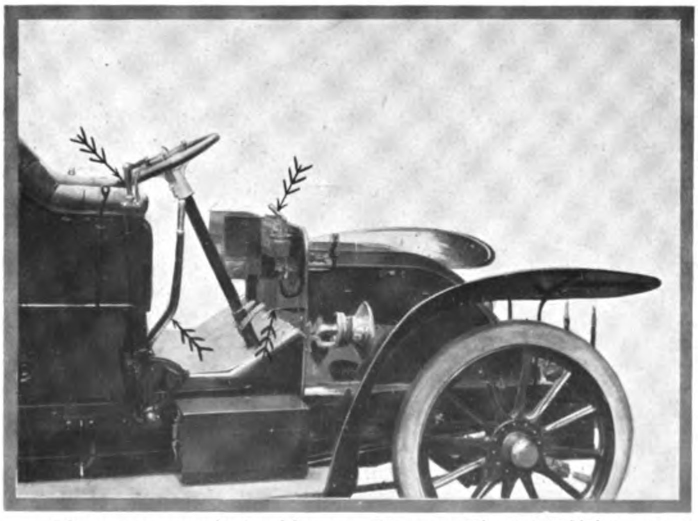
* * *

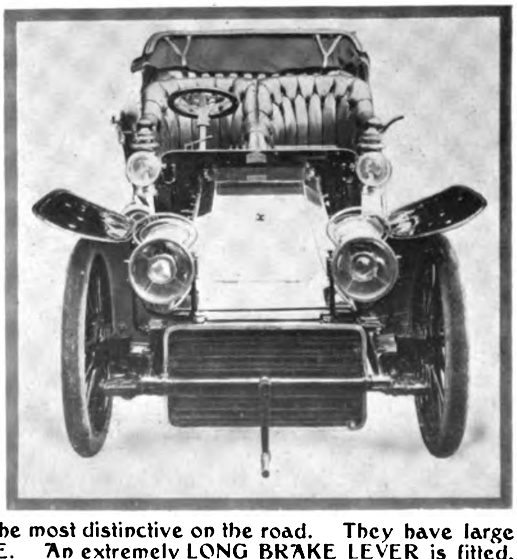
(No. 28).

The C. G. V.

(FRENCH)

14, 20, & 30 H.P.

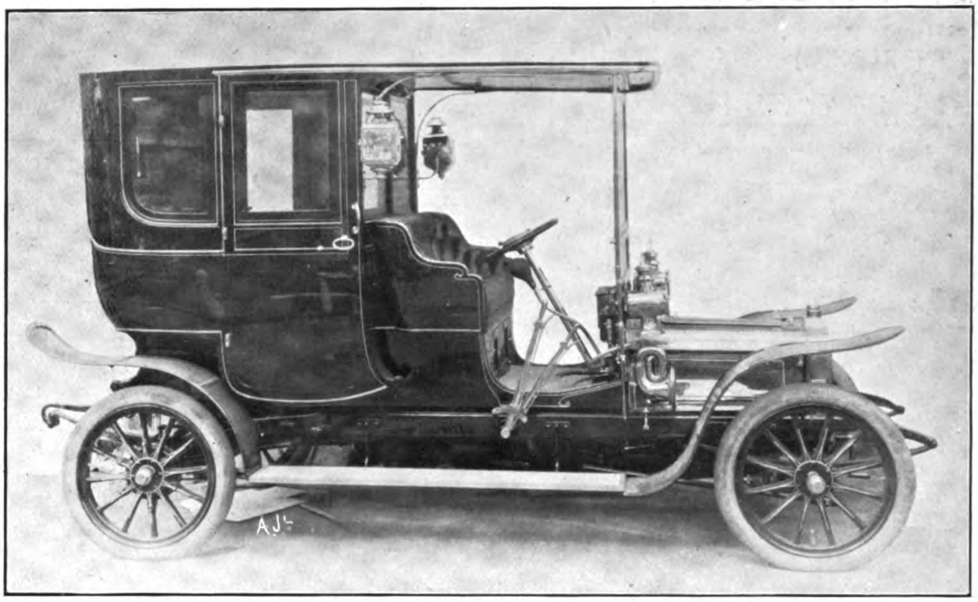




These cars, made by Messrs. Charron, Giradot & Voigt, are among the most distinctive on the road. They have large SLOPING BONNETS and the RADIATOR HANGS BELOW THE FRAME. An extremely LONG BRAKE LEVER is fitted, and the CHANGE SPEED LEVER IS BENT. On the dash is a peculiar type of oil cup, and another detail is the small curved accelerator pedal.

THE CLEMENT-TALBOT PETROL CARS.—PART I.

SINCE the imposing works built by the Clement-Talbot Company at Ladbroke Grove were first opened, an enormous amount of progress has been made continuously throughout the factory, and during the past few months in particular, the manufacturing facilities in the way of special plant have been added to considerably. The progress has enabled the Company to steadily increase its output, and to gradually build a greater and greater percentage of the cars which they are selling in this country, until they are now not only constructing several British types of chassis, but quite a number of engines also. Although for the most part based on the well-tried French designs, the English models differ in several important details, and this is so particularly of the new 20-h.p. all-British vehicle, to which we propose to devote our chief attention in this article, after having first disposed of matters of a more general character. Whether built in England or in France, however, a very strong resemblance exists between all the Clement-Talbot models, the only radical exceptions being that the two smallest types have twin-cylinders instead of 4-cylinder engines, and that the three largest have side chains instead of live-axles.



The 12-16-h.p. Clement-Talbot car with Brougham body.

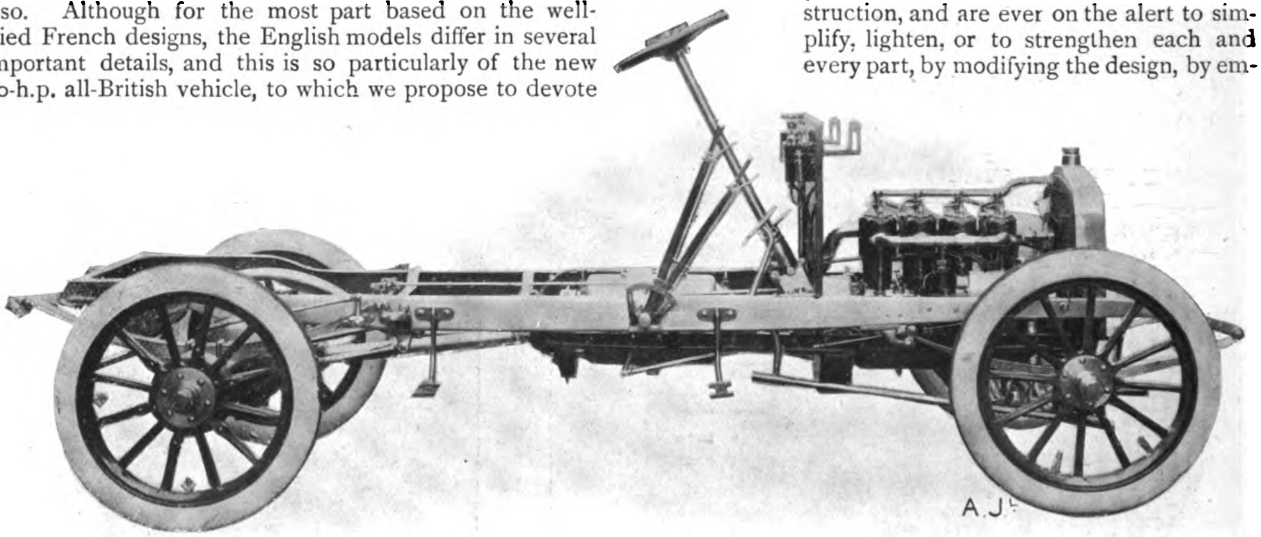


Fig. 1.—Side view of the 12-16-h.p. Clement-Talbot Chassis.

Most conspicuous at the Ladbroke Grove works is the thoroughness with which Mr. Garrard—the well-known works manager—has organised everything with a view to turning out first-rate cars at a reasonable price, for not only is the entire equipment of the various shops laid out to this end, but Mr. Garrard and his staff of designers have made a very close study of all the various problems connected with motor car construction, and are ever on the alert to simplify, lighten, or to strengthen each and every part, by modifying the design, by employing improved grades of material, or by adopting more efficient processes in the shops. Nothing, for instance, is more marked than the care which has been taken to obtain the most suitable kind of steel, and to ensure efficient treatment for obtaining the required degree of

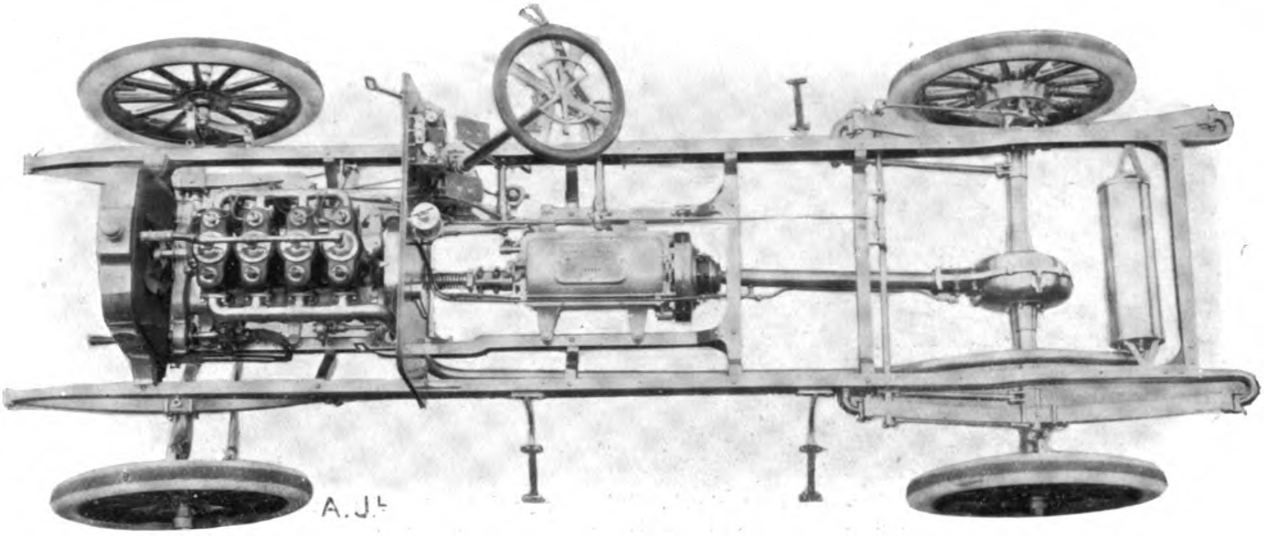


Fig. 2.—The 12-16-h.p. Clement-Talbot Chassis; view from above.

hardness and toughness as it passes through the machine shops. Equally noticeable, too, is the attention that has been devoted to keeping down the cost of labour, to which end machine tools of the most up-to-date character are installed in the works, and quite a number of them are now operated by girl mechanics. Many of the parts are, as will be gathered from the detailed description which we are now enabled to give of the latest models, of special shape and of unusual construction, in order to achieve a distinct advance on ordinary, and at present accepted, practice.

The standard cars consist of an 8–10-h.p. tonneau, an 8–10-h.p. side-entrance model, a 10–12-h.p. side entrance vehicle—both these having twin-cylinder engines—larger live-axle models of 12–16-h.p. and 20–24-h.p., with 4-cylinder engines, and chain-driven cars of 24–30, 35–40, and 50–60-h.p. At present it is the 20–24-h.p. that represents the latest developments made by the English Company, this machine not only having been built entirely in their own works over here, but having been re-designed throughout by Mr. Garrard. Its special features are numerous, as will be seen presently, including as they do a multiple-disc clutch, a duplicate ignition system, and a very much improved transmission mechanism; but before dealing with it in detail, a few words should be devoted to the other standard models. Those which are smaller are practically alike except in size, and therefore the illustrations which we are able to give of the 12–16-h.p chassis may be taken as typical of the 8–10-h.p. and the 10–12-h.p. cars also. None of the chain-driven types are as yet built in England, though quite a number of these more powerful vehicles have been sold in this country. A few of their leading characteristics may conveniently be mentioned in passing, and attention may also be drawn to the fact that, apart from the purely racing models, the French house are now turning out a fast live-axle machine with a 4-cylinder engine that develops 100-b.h.p. (160 mm. bore by 160 mm. stroke) at 1,200 r.p.m., and is geared to about 70 miles per hour on the fourth speed. The chain-driven cars have pressed-steel frames which pass right across beneath the engine and the gear-box, thus dispensing with any separate underframe, as also with any loose dust casing. They also have the differential-gear enclosed in a separate casing, quite distinct from the gear-box.

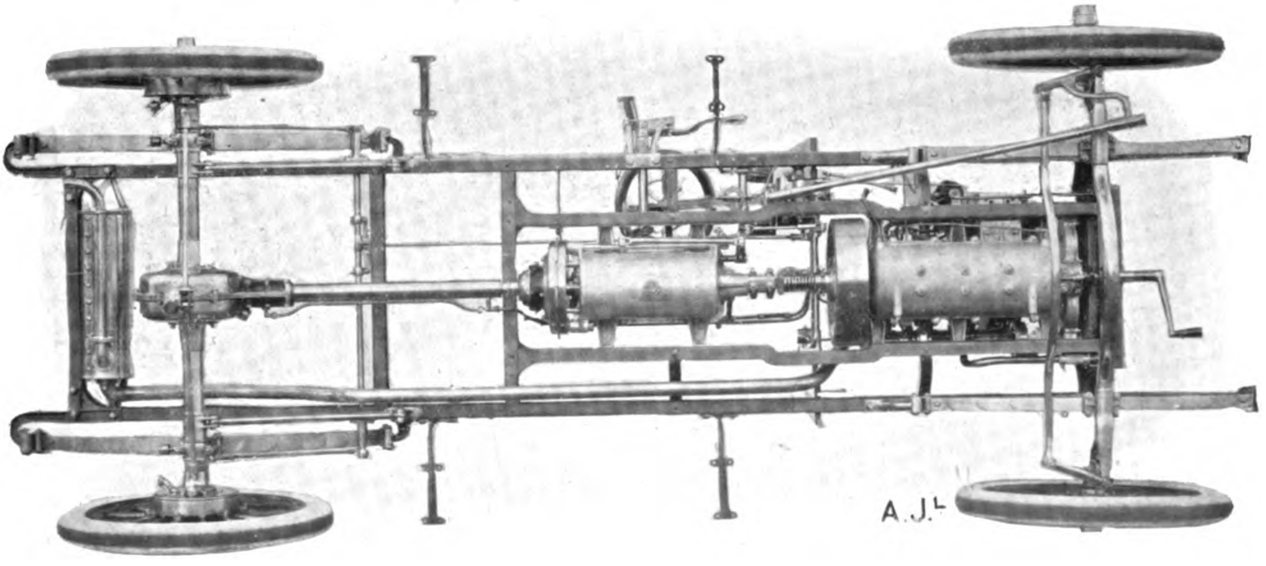


Fig. 3.—View, from beneath, of the 12-16-h.p. Clement-Talbot Chassis.

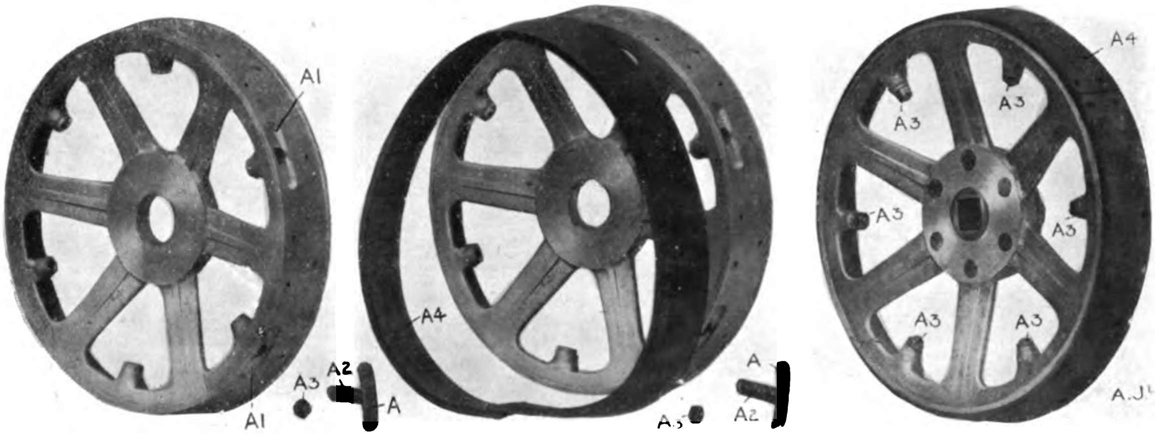
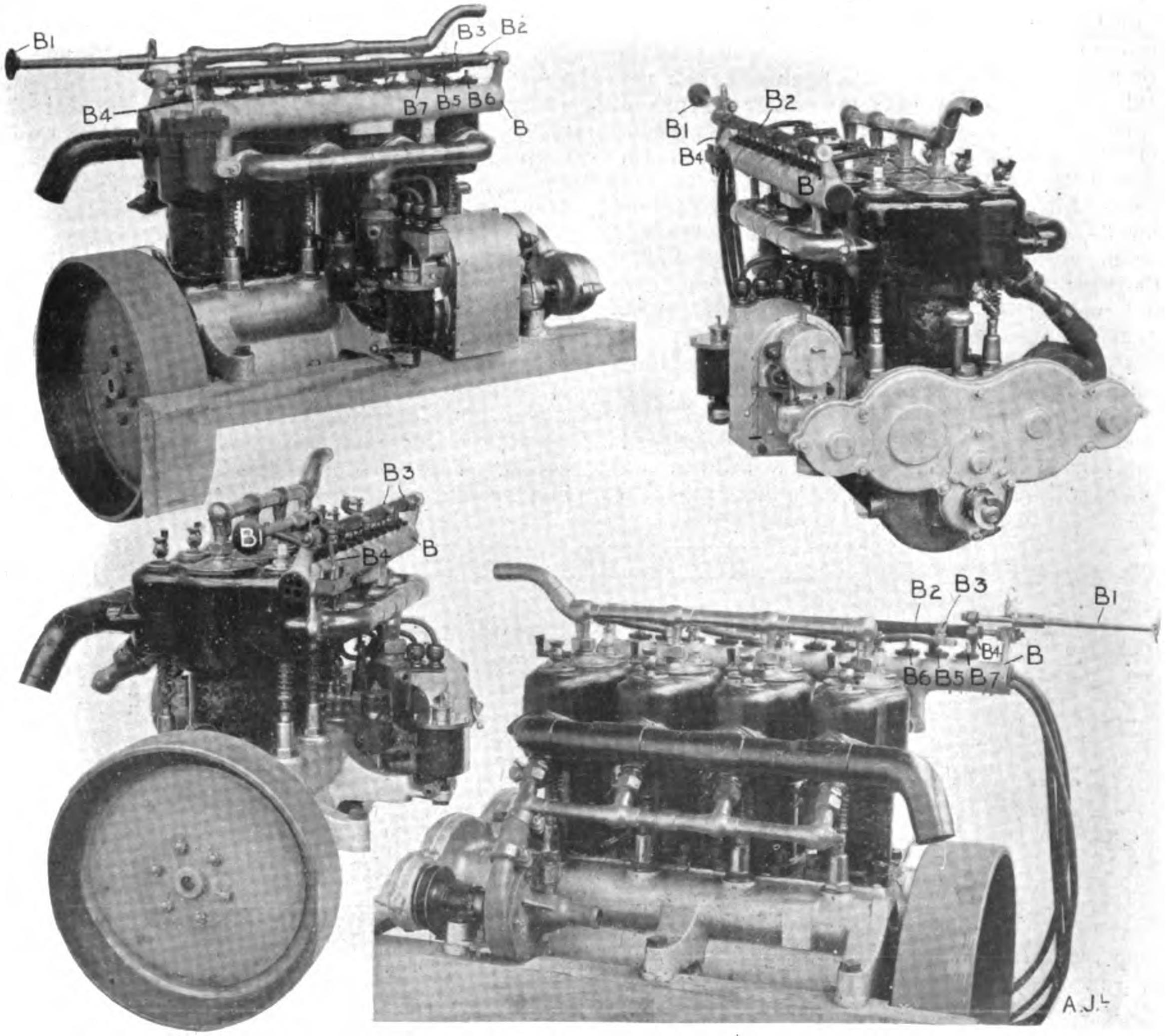


Fig. 4.—The Clement-Talbot leather-faced cone clutch. : Three views showing the method adopted for enabling the "softness" of the clutch to be readily adjusted.

The 12–16-h.p. chassis is shown from the side, from above, and from beneath respectively, in Figs. 1, 2, and 3, and practically every portion of the mechanism is thus rendered visible in these illustrations. Both the engine and the gear-box are carried upon inner members of the pressed-steel frame, and these two members are curved outwards in the neighbourhood of the fly-wheel in order to allow it to be of large diameter. The same form of



Figs. 5, 6, 7 and 8.—Four views of the 12-16-h.p. Clement-Talbot engine, fitted with the special switch-device for enabling the high-tension magneto or the battery system of ignition to be employed in conjunction with the same ignition-plugs.

construction is followed throughout on the two smaller cars, except that everything is shorter and smaller to suit the twin-cylinder engines. The live-axle is, it will be seen, tied to the main frame by radius-rods at either end, and is rendered quite free to move about these radius-rods, since the spring-brackets merely float upon the axle-tubes. The torque is, however, taken by another steel tube which surrounds the propeller-shaft, this tube being firmly fixed to the axle-casing at its rear end. There is consequently only one universal-joint on the propeller-shaft, this being close up to the foot-brake, immediately behind the gear-box. In all other respects it will be recognised that this chassis follows ordinary orthodox lines, with the two engine-controlling levers working over a stationary quadrant above the steering-wheel, and with the customary pedals and side levers.

On these cars, the main clutch is of the leather-faced cone type, and has arranged beneath the leather band a number of plates, as seen in Fig. 4, for enabling it to come into operation gradually. The plates, A, fit into corresponding slots, A^1, in the aluminium casting, and are normally forced outwards against the leather facing, A^4, by means of helical springs, A^2. These springs can, however, only force the plates outward a certain distance, their movement being limited by the adjustment nuts, A^3, which lie inside the clutch ring. Should the clutch at any time become too "fierce," it is only necessary to slightly tighten up each of the nuts, A^3, removing the locking split-pin for this purpose, and subsequently replacing it to prevent the nut from working loose.

On the new 20–24-h.p. model, two sets of ignition plugs are fitted, as will be seen presently, but on all the earlier standard models provision is made for one set of plugs only. Owing to the demand for magneto ignition, with a battery system as a stand-by and for starting, the 12–16-h.p. and the 10–12-h.p. English cars are now equipped with a special switch mechanism as well as with a high-tension magneto. A 12–16-h.p. engine so fitted is shown in Figs. 5, 6, 7, and 8, where it will be seen that a neat aluminium casting, B, is fixed in place alongside the cylinder heads on the right, and that an operating rod, B^1, projects rearwardly through the dashboard. When this switch is operated, it automatically brings either the magneto or the battery into use, making the necessary low-tension circuits by means of the lever arm, B^4, and simultaneously switching over the ignition-plugs to one or other set of high-tension terminals. The high-tension contact-pieces, B^3, and the low-tension switch-arm, B^4, are secured to an insulating-sleeve, B^2, that is free to slide longitudinally on a stationary rod. When pushed forward, the high-tension switches connect the ignition-plug terminals, B^5, with the magneto terminals, B^6, and when drawn rearwardly they connect the terminals, B^5 and B^7, together instead. This switch device, which is known in the works as the "Clarionette" has proved to be most effective in practice, and is a very satisfactory method of converting an engine, although it is naturally not as neat or compact as if the engine were originally designed for duplicate ignition systems.

It only remains in connection with these earlier live-axle models to say that the 8–10-h.p. has cylinders of 85 mm. bore by 110 mm. stroke, the 10–12-h.p. has cylinders of 100 mm. bore by 120 mm. stroke, that both these twin-cylinder vehicles have three forward speeds available, and that the 12–16-h.p. car, which has cylinders of 85 mm. bore by 120 mm. stroke, has four forward speeds.

All Clement-Talbot engines are alike in having separate cylinders with valves arranged symmetrically on opposite sides, with the crank-chamber divided horizontally through the main bearings, and with the whole of the gearing enclosed in front. Combined with them are the pump and the magneto, both of which are driven by spur-wheels. A very good idea of both the smaller, and of the more powerful engines, can, therefore, be obtained from our illustrations of the 12–16-h.p. model, to which we have already referred, and from the further drawings and photographs which will be given presently of the new 20–24-h.p. English engine.

(*To be continued.*)

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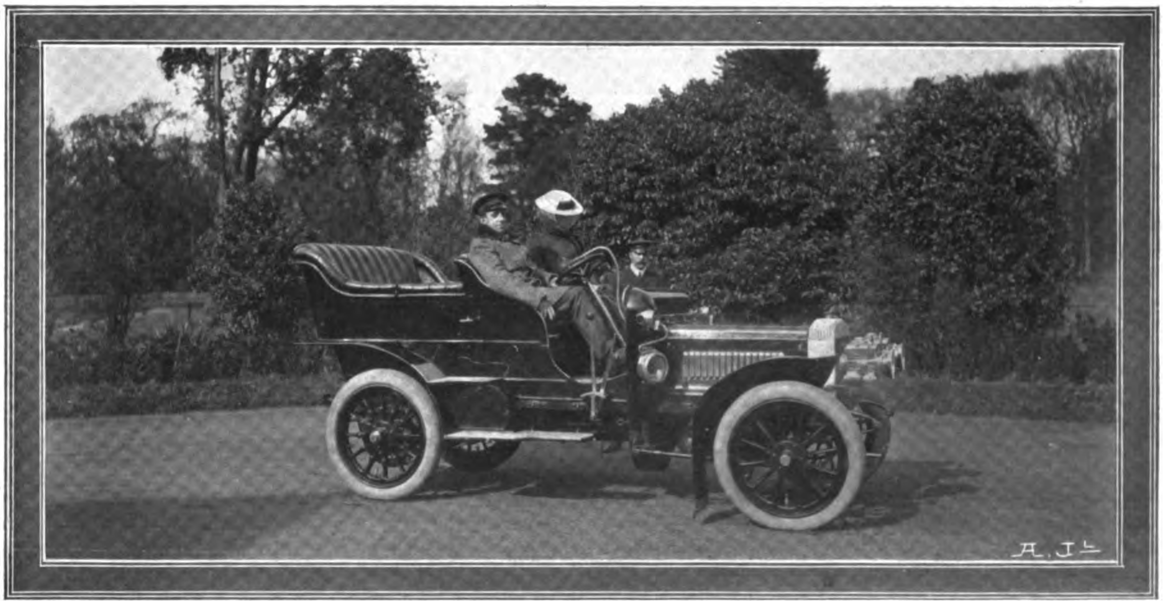

His Majesty King Alfonso of Spain at the wheel of one of the high-powered Daimler Cars, which he has been driving during his stay in England. Princess Ena of Battenberg, the future Queen of Spain, is seated by the side of the King.

THE AUSTIN PETROL CARS.—PART II.

(*Continued from page* 538.)

FOLLOWING on with our brief recital of the more notable or novel features of this most promising new make of car, and in this way clearing the ground in readiness for a systematic consideration of the various parts in detail, reference should be made to the very effective automatic system which has been adopted for lubricating the engine. A chain-driven lubricator on the dashboard forces measured doses of oil to each cylinder and to each of the end bearings of the crank-shaft, while a pump fitted on the engine pours a continuous stream of oil over all the other bearings inside the crank-chamber. This pump draws its supply from a sump in the base of the crank-chamber, into which the oil is again returned through sloping pipes that prevent it from finding its way back direct to the crank-chamber proper, even when the car is on a very steep hill. Every precaution is thus taken against smoky exhaust gases being emitted from the engine, and yet there is no fear of under-lubrication without the cognisance of the driver. Even those burnt gases which must be allowed to escape into the atmosphere can be directed out at either side of the car—as may be least objectionable under the conditions that prevail at any particular moment—for there is, under the direct control of the driver, a special cock fitted behind the silencer for this purpose. This device has already been referred to in our columns, and on March 10th (page 288) we gave an illustration of it.

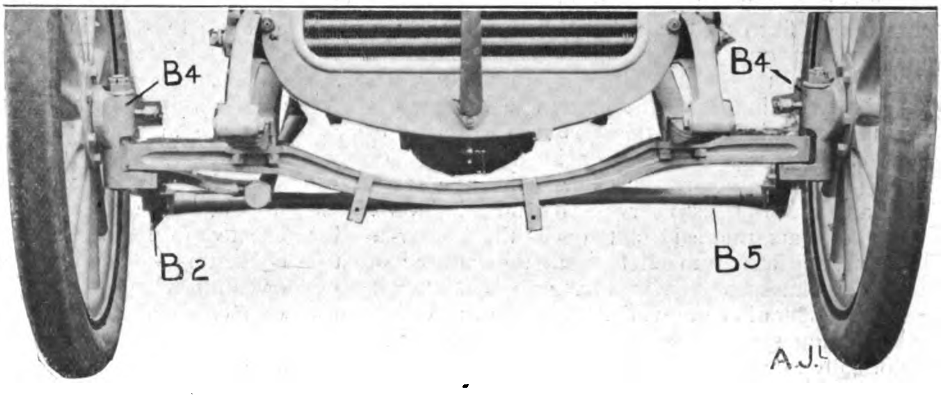

Fig. 5.—View of the "Austin" front axle, showing the special steering-heads, and the straight tie-rod that passes across behind the axle.

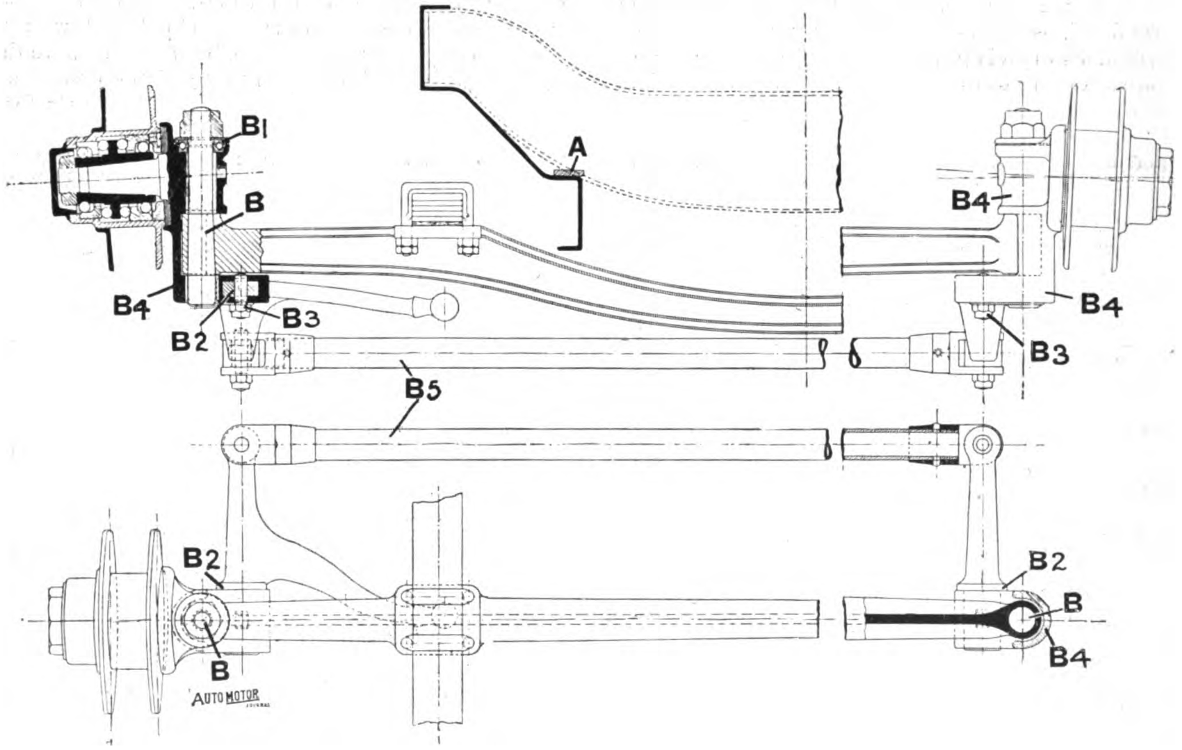

Fig. 6.—Front elevation and plan (partly sectional), showing the construction of the "Austin" front axle, and also the shape of the pressed-steel main frame.

For the moment, it need only be said with regard to the transmission gear—(1) that the multiple-disc clutch has flat discs (of steel and bronze alternately), and that no special mechanical means are employed for separating them; (2) that the clutch has one large volute spring; (3) that both the shafts in the gear-box have intermediate bearings as well as those at each end; and (4) that ball-bearings of the Hoffmann type are fitted through the transmission as well as to all four road-wheels. Further than this, attention should be drawn to the very large sprockets on the chain-driven cars, and to the specially constructed universal-joints on the live-axle model, since both these features have an important bearing upon the quietness of running and upon the durability of the driving mechanism. We need hardly add, moreover, that the design of the live-axle itself, and of the differential-countershaft in the other case, are well worthy of study.

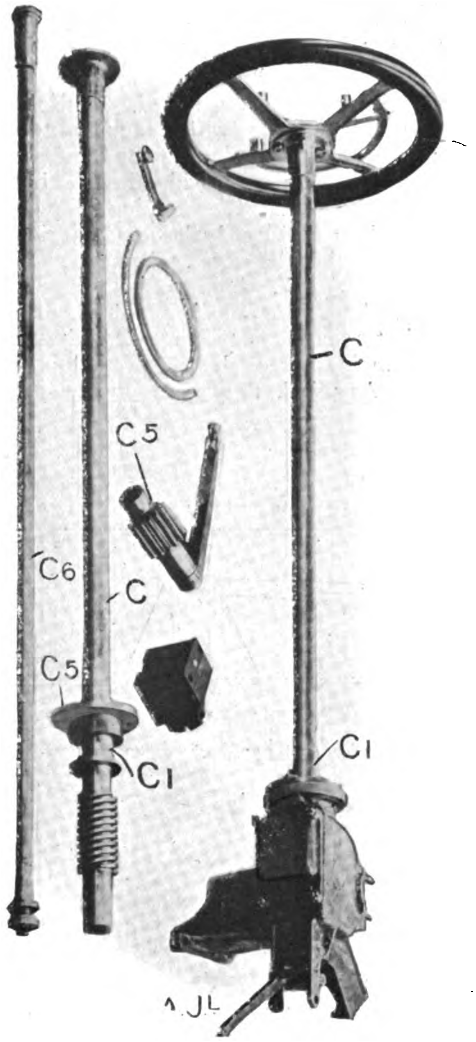

Fig. 7.—Views of the "Austin" worm-and-nut type of steering-gear, complete and in parts.

All the brakes have easily renewable metal-to-metal friction faces, and great care has been taken to prevent the oil in the adjacent bearings from finding its way on to them. In the case of the hub-brakes, in particular, this risk of annoyance has been effectively guarded against, any oil that may succeed in passing the oil-retaining felt washers being conveyed by specially shaped sleeves so that it falls quite clear of the brake-drums. They are, too, provided with readily accessible adjustment devices for taking up any wear that may occur, besides being so arranged that the shoes can neither rattle about nor rub against the drums when not in use.

Originally it was Mr. Austin's intention to also build a live-axle car of 15–20-h.p. this year, but this model has been withdrawn owing to the great demand there has been for the more powerful vehicles. The standard 25–30-h.p. car has a wheel-base of 9 ft. 9 in. with a track of 4 ft. 7 in., and the front and rear tyres are, respectively, 910 mm. by 100 mm. and 920 mm. by 120 mm. The engine has cylinders of 4½ in. bore, with a stroke of 5 in., and the actual power developed is about 33 b.h.p. at a speed of 900 revs. per min. Usually a radiator of the honeycomb type will be fitted unless otherwise ordered, but the car from which our photographs were taken has a radiator that is built up with a number of finned tubes, placed horizontally. With its 30-tooth sprockets, the gear-ratios of the transmission are such that the chain-driven vehicle runs at 13, 19, 27, and 37 miles per hour on the four forward speeds, respectively, when the engine is making 900 revs. per min., but provision is made whereby either this car or those having live-axles can be geared higher or lower to suit individual requirements. The chassis weighs about 18 cwt., and the capacity of the petrol tank is about 20 gallons.

Constructional Details.

Our illustrations give a good idea of the shape of the main-frame, the special feature of which is that the pressed-steel side-members curve down as indicated in Fig. 6, so that they also constitute an underframe for the engine and the gear-box. The frame is built up with four pressed-steel cross-members, and along that portion

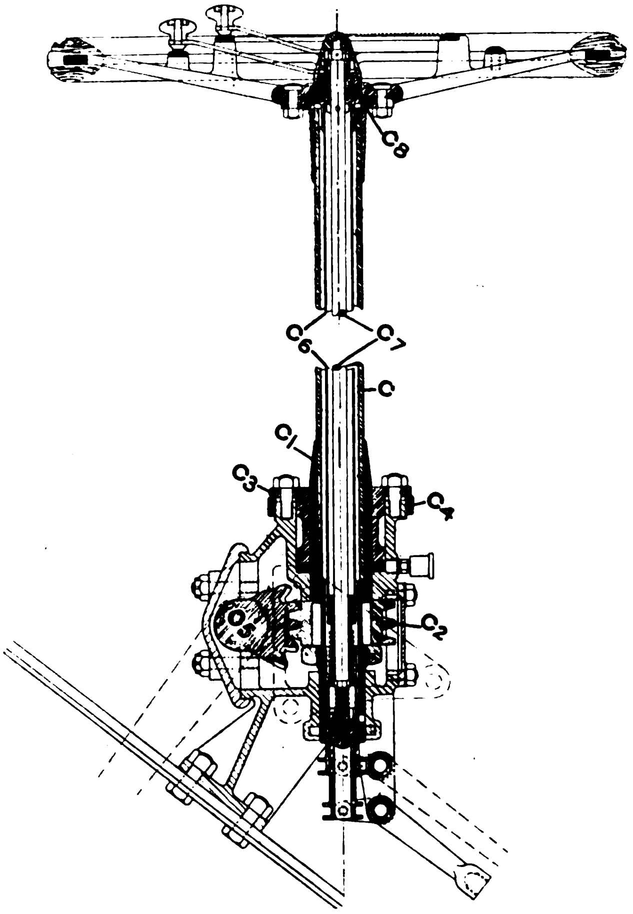

Fig. 8.—Sectional drawing of the "Austin" worm-and-sector type of steering-gear fitted complete with the steering-wheel and the engine-controlling hand-levers.

upon which the engine and the gear-box will ultimately rest are riveted two steel strips, A (Fig. 6), which are planed up in place to form a perfectly true pair of faces to receive those portions of the mechanism.

The side-members are also so shaped that they curve inwards in front of the dashboard to give a wide steering-lock (*see* Fig. 2) and that they curve upwards over the back-axle, and then downwards, as seen in Fig. 1. Their extreme rear-ends are tied together by a cross-bar, which also carries the shackles for the springs (*see* Figs. 2 and 3), and it is between this cross-bar and the frame proper that the neatly-shaped petrol tank is fixed. In this way the tank is caused to project behind the body on the completed car, and thus it is particularly easy of access, although its shape renders it quite unobtrusive. Another point in connection with the main-frame is that all the shackle-pins have very large bearing surfaces.

A steel forging, having an **I** cross-section, forms the front axle, and this is lightened somewhat, as seen in Fig. 5, towards the curved centre. At each end it is bored out to tightly fit down upon the taper pins, B, that form the pivots for the steering heads, B^4, the weight of the car, therefore, tending to force the axle down tighter upon the pins. These pins, B, fit freely inside phosphor-bronze bushes, which are let into the steering heads, B^4, and thus a good bearing surface is obtained both above and beneath the axle. The forgings, B^4, also constitute the stub-axles which carry the road-wheels on double compound ball-bearings, and they are so shaped that the road wheels are given the required amount of dish. For taking the weight of the car on the steering-heads, ball-thrust-bearings, B^1, are fitted, as seen in Fig. 6, and for feeding grease into the steering-heads, lubricators are fitted, as seen in Fig. 5.

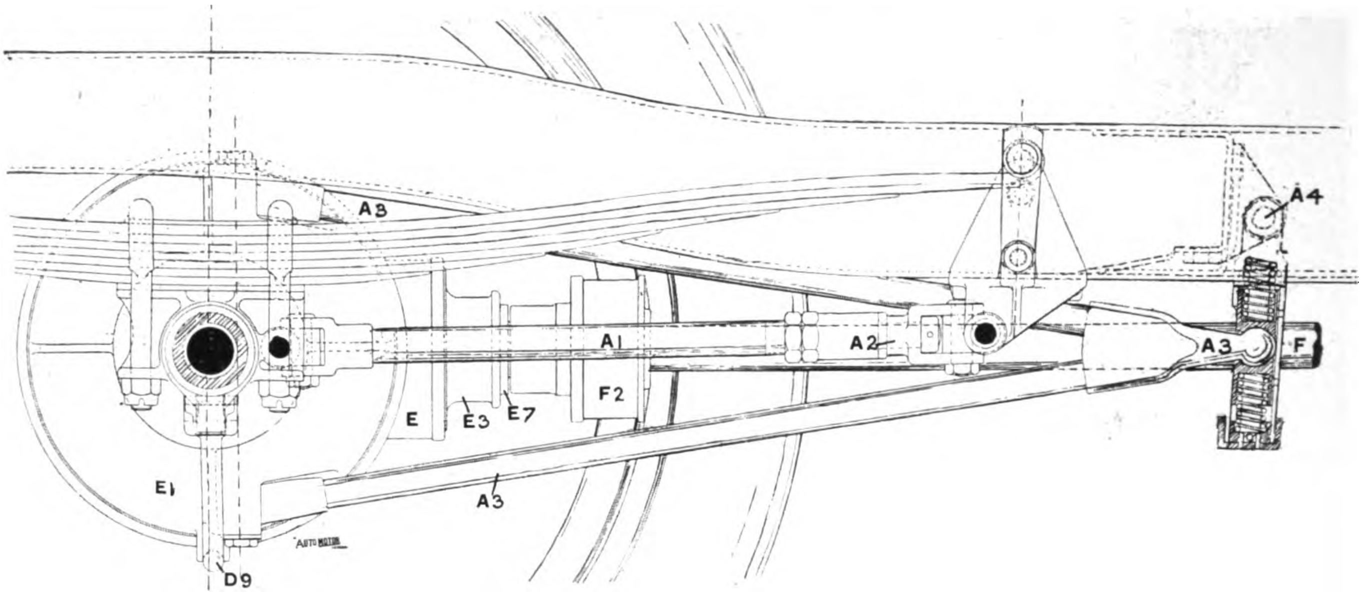

Fig. 9.—Side elevation of the rear portion of the "Austin" Chassis, showing the shape of the semi-elliptic springs, and of the curved frame. The special radius-rods and the torque-rod (live axle model) are also prominent in this drawing.

An interesting piece of construction is the method by which the steering arms, B^2, are fixed to the forgings, B^4, the latter being slotted out to receive the former, and the former being given a rectangular cross-section projecting from a shoulder. After being slipped into place, they are rigidly held together by a taper stud, B^3, which has a nut beneath. Behind the axle, the tie-bar, B^5, which passes across from one steering-arm to the other, is quite straight, and its knuckle joints—like all other knuckle-joints on the Austin car—have hardened steel sleeves around the bolts, so as to permit the bolts themselves to be pulled up dead tight.

For the standard car, the steering-gear to be employed is that of the worm and sector pattern, of which we give a sectional drawing in Fig. 8, but on the first vehicle that has been completed the steering-gear of which views are given in Fig. 7 has been used. This latter type is of a worm and nut type, with a rack and toothed quadrant, but otherwise the design is the same as in Fig. 8, and the novel features are identical in both. These illustrations show that the steering-pillar tube, C, is securely fixed to a flanged sleeve, C^1, at its lower end, this sleeve carrying the worm, C^2, and being held down by a thrust-block, C^3, which prevents any longitudinal movement. The thrust-block is pulled down tightly by studs, and it then locks the threaded adjustment-collar, C^4, which enables precisely the desired position to be obtained. As usual, the worm operates the toothed quadrant, C^5, which is solid with the external steering-arm, and thus rocks it about its axis. The whole of the gear is enclosed in an oil-tight case, and there is a lubricator fitted by which grease can be forced upon the thrust-collar.

At the top of the steering-pillar, C, is fixed a flange fitting for receiving the split collar, C^8, which prevents the inner tube, C^6, from moving endways. By making the collar, C^8, in two halves in this manner, the engine-controlling mechanism can be removed from above without disturbing the steering-gear, this sometimes being a convenience in practice. The tube, C^6, and the central rod, C^7, carry the throttle-lever and the timing-lever at their upper ends, while at their lower ends they are provided with feed-screws which act upon sliding sleeves inside the large sleeve, C^1, and thus give the necessary rocking motion to the bell-crank-levers with which the two sleeves engage. No provision is needed for holding the control levers stationary when the steering-wheel is turned, both the quadrants for these levers being fixed direct to the wheel.

(*To be continued.*)

THE GEARLESS NAPIER CAR.

FOR some little time it has been an open secret that the famous Napier firm were about to introduce a gearless vehicle, and now the public preliminaries which herald its advent are being performed by a car which Mr. S. F. Edge has entered for an official trial under the A.C.G.B.I. rules.

Mr. Cecil Edge on the Gearless Napier.

It is not difficult to trace the inception of this latest idea of the Napier firm, for the first steps were, consciously or unconsciously, taken when Mr. Edge became such a strong advocate of the 6-cylinder engine. Prominent amongst the claims which have been advanced in favour of 6-cylinder cars is that the necessity for the change-speed-gear is reduced. This being so, it is not surprising that an enterprising firm should endeavour to clinch their argument by placing upon the market a car which is actually *minus* the gear-box.

In October last (as recorded at the time) a chain-driven 40-h.p. six-cylinder Napier car was entered for a top-gear run, and in that test it successfully accomplished, under official observation, a trip from Brighton to Edinburgh without changing speed. Between that test and the trial, which is now being held, there is no difference as regards the nature of the event, but whereas the car tested in October had a set of change-speed-gear wheels, for use if required, this car has none except that required by law to enable it to reverse. As a demonstration in favour of gearless cars, *qua* "gearless," this test is only of secondary importance. Apart altogether from the possible saving in prime cost, there still remains the question as to the desirability of retaining the change-speed-gear for other reasons than those of absolute necessity. Motorists who appreciate this aspect of the case will, of course, still be able to acquire the standard Napier cars as heretofore. What Mr. Edge has set out to show, however, is rather that the gear-box can be eliminated on a standard Napier car, and that the car still remains a satisfactory touring vehicle without it.

The car with which the present trial is being conducted, has a standard 60-h.p. 6-cylinder engine, with cylinders of 5-inch bore and 4-inch stroke. These 6-cylinder Napier cars were described in our issues of January 13th, 20th and 27th last, so that no further reference to the mechanical features need be given here—except to state that a multiple-disc clutch was fitted instead of the usual metal cone type. On Monday—when we had the pleasure of accompanying the car—Mr. Cecil Edge drove down to Bexhill, *viâ* Guildford, Arundel, and Brighton, and some speed tests were carried out on the private track. Over a measured quarter of a mile the fastest of six runs was 15⅓ secs., which is equivalent to a speed only a fraction under sixty miles an hour (59·2 m.p.h.). Over the same distance the car was also driven, with the clutch fully engaged, at 4·45 miles per hour, so that the engine was shown to have a range of 13·3 to 1. With the actual gear ratio in use (14 to 43), and with the wheels shod with 895 mm. Michelin tyres, this range indicates that the lowest useful engine speed was 130 revs. per min., and the maximum was 1,720 revs. per min. It can hardly be urged therefore, that the car, which probably weighed about two tons loaded, was geared unduly low.

Following the run on Monday to Bexhill and back, the programme included a trip to York on Tuesday, and from York to Edinburgh on Wednesday, the return journey to London occupying the two following days, thus completing a distance of a little over 1,000 miles.

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THE HEDGELAND AXLE—JUDGES' REPORT.

PARTICULARLY those who are still imbued with the old idea—obtained originally from cycle practice—that no free-wheel device can compare favourably with a differential-gear on motor cars, but also all motorists and automobile manufacturers will peruse with much interest the report which has just been issued by the Automobile Club as a result of the 1,000 miles' trial that has recently been conducted by them with a 30-h.p. Cadillac car fitted with the Hedgeland solid live-axle. This report fully bears out the remarks made by us in our issue of April 14th last, when we gave a carefully-considered illustrated article describing the construction as well as the action of that device, and it certainly tends to show that the Hedgeland axle is not only a commercially useful mechanism but that it possesses certain distinct advantages.

Referring to the fact that it is the inner driving-wheel which alone tends to propel the car when turning corners under normal conditions, the report says:—

> "In this connection it should be mentioned that the lost motion between free wheel and driving wheel action is so small that the slightest amount of slip of the wheel that is driving causes an immediate distribution of the driving effort between both wheels. The lost motion and irregularity that might be expected from the use of a free wheel device is absent, as shown by examination made at the conclusion of the trials.
>
> "The observer reported most favourably on the steering and behaviour of the car on the straight, round corners and curves, no manipulation of the clutch being necessary. Sunrising Hill was included in one of the routes."

And on the subject of skidding, the following extracts are instructive :—

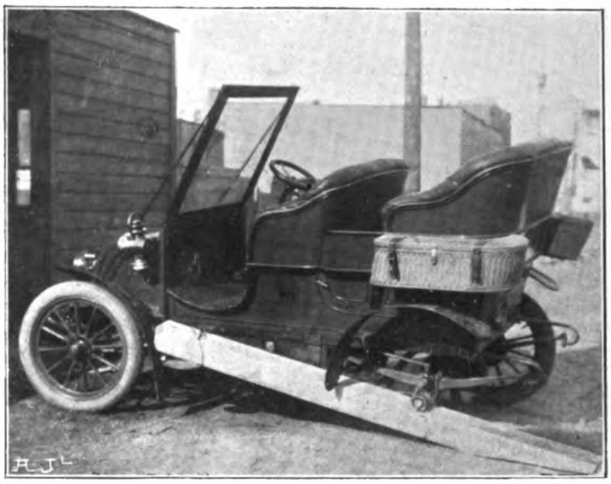
> "A long series of trials, in which the car was run at different speeds and under different conditions over a prepared slippery surface, were carried out. Various experiments were also made with blocks of wood and other obstacles placed in front of either driving wheel, both on slippery and on dry surfaces. Further experiments, in which the brakes were suddenly applied, were made on the same surfaces. With this axle the force applied in the propulsion of the car is that due to the sum of the adhesions of the two driving wheels, whereas with the ordinary differential-gear it is not more than twice that due to the smaller adhesions. With the Hedgeland axle, if only one driving wheel finds good adhesion while the other wheel is on slippery ground, the former transmits the power. Where a difference of adhesion of one driving wheel as compared with the other is due to distribution of the weight in the car or the hardness of tyres, or where unequally effective brakes are acting upon the two wheels, the wheel having the best adhesion or the strongest braking effect, does a proportionately larger amount respectively of the driving or retarding. The experiments showed an appreciable absence of any tendency to slip or skid."

The report also contains, in addition to a brief description of the axle, these important statements and comments :—

> "The car weighed, ready for the road but without passengers, 3,659 lb., of which 1,938 lb. were carried on the back axle. The average additional weight due to the passengers was 740 lb. per day. On six running days, between the 5th and the 12th of April, the car ran 1,000½ miles without any stop due to the axle. The usual system of braking on the propeller-shaft or with the engine is not readily adaptable to a car fitted with the Hedgeland axle.
>
> "At the conclusion of the run the axle was found to be in good condition, and showed no signs of wear, and the report of the official observer shows that it ran without attention and silently."

A Clever Makeshift.

An interesting episode, which illustrates a useful characteristic of the solid live axle, has been brought to our notice by Mr. Webster. It appears that, whilst undergoing some tests in U.S.A., a car fitted with the Hedgeland solid axle met with a collision which carried away one of the rear wheels. Our photograph shows the improvised runner, formed out of a baulk of timber, which was lashed in place as a support; and in this manner the car was driven home, a distance of 12 miles, without further trouble. This incident clearly shows that the propulsion of a car, fitted with a solid live axle, is independent of the adhesion of *both* rear wheels. It is true that a car fitted with a differential gear might have been driven in this manner if there had been any means available for effectively anchoring the free axle end, but it must be remembered that the whole power would then have had to be transmitted through the differential pinions, and these are not generally constructed to withstand any prolonged load of this nature.



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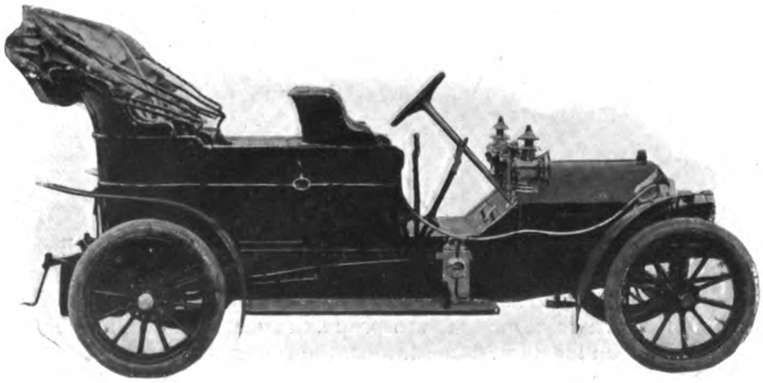
A NIGHT AND DAY 1,000 MILES "NON-STOP" RUN.

The following is an extract from a club report on the trial of the Regent car—described in The Automotor Journal of October 7th and 14th, 1905—which Messrs. S. F. Edge entered under the A.C.G.B.I. rules :—



The Regent Car.

The first run was to Cheltenham and back. The start was made at 7.1 p.m., and the car ran throughout the night over a distance of 201½ miles without making any involuntary stops.

The second day's run was for 205 miles, on the Birmingham road. On two occasions a magneto tappet rod was adjusted, petrol and water tanks were filled, and engine lubricated once during this run. The third run was along the Great North Road for 198½ miles. Adjustments on this occasion were the tightening of a magneto tappet rod and the changing of an igniter. Radiator, petrol, and oil tanks were filled, and the car oiled up. The fourth run was to Box and back, on the Bath Road, and the distance was 201 miles, adjustments on the road being the changing of two tappet rods and the tightening of the sprag.

The last run was along the Exeter Road as far as Mere and back, a distance of 201 miles. This was a non-stop run, and finished the distance the car was entered for. The amount of petrol used during the whole of the trial was 74½ gallons, and of water 26¾ pints. The total distance covered during the three days and three nights the car was running was 1,007 miles.

The above record constitutes a brief summary of the events connected with the trial and is not, of course, the full official report, which will be issued by the officials in due course.

AN APOLOGY TO OUR READERS.

[We discovered, too late for correction, that the following prospectus, intended presumably for our advertisement pages, had by some unpardonable oversight been "made up" in the Editorial columns. We therefore ask the indulgence of our readers under the circumstances, and undertake to use greater care in future so as to prevent the recurrence of such a blunder.]

The Subscription List will open on the 1st April, 1906, and will remain open day and night.

The BLUNDER BUS COMPANY,

Limited by Nature and by Law.

CAPITAL - - £1,000,000.

Divided into 999,999 Ordinary Shares of £1 each and one Extraordinary Share of £1.

ISSUE OF 999,999 ORDINARY SHARES OF £1 EACH, PAYABLE IN FULL ON APPLICATION.

After the Ordinary Shares have received a small Dividend, the Extraordinary Share will receive the Balance.

At General Meetings of the Company, the Extraordinary Shareholder will alone be permitted to vote.

Directors.

LORD MACADAM, OF NEEDY HALL, PICKING OAKHAM.

WINNING MANNERS, OF BLARNEY, IRELAND (Director of the Stationary Omnibus Syndicate).

LE STRANGE STOREY, OF JAMAICA (LATE Managing Director of the Decent Burial Association).

Bankers, Brokers, Auditors and Solicitors.

To avoid all unnecessary expense until after allotment, no appointments have been made.

Offices and Secretary.

(Very *pro tem.*)

WILL BUNK, FLEET STREET, E.C.

PROSPECTIBUS.

THIS COMPANY has been formed to run a Blunder Bus.

Short as is the time which has elapsed since the Troglodyte rode upon the mammoth, it has been sufficient to thoroughly establish the fact that man must ride upon something.

Amongst many failures the latest is the ordinary bus.

The Blunder Bus is, however, quite different to the ordinary bus.

Ten advantages of the Blunder Bus over every other bus:—

1. Absolutely without vibration.
2. Entire absence of motion.
3. In fact, no movement whatever.
4. Consequently no noise.
5. And no smell nor explosions possible.
6. No starting, and, *ipso facto*, no stopping.
7. Therefore no wear or tear.
8. No fitters, or chauffeurs.
9. No contracts for maintenance.
10. No running costs whatever.

Speaking generally from the point of view of the Public, it will be quite evident to the meanest intellect that the drawbacks of every other bus will thus be absent from the Blunder Bus.

(*Vide* the verdict of the LONDON PRESS on the Blunder Bus APRIL, 1906.)

The Bus, the monopoly of which this Company has secured for one hundred years for use within 1,735 miles of the Company's registered Office, is patented. It should be observed that whereas all other kinds of power are likely to rise in price, gas is growing cheaper every day, and a large supply is always to be found at the Company's Offices.

Since it possesses none of the moving propensities of the ordinary bus, there can be no question as to the Blunder Bus being preferentially used by the Public, and since as we have shown the expenses are relatively nil, the Profits will be Colossal.

This is borne out by a letter we have received from the well-known expert, Mr. A. L. Wright:—

> "GENTLEMEN,
>
> "In accordance with your instructions I have casually glanced at the Blunder Bus, and provided you are all right (and I am all right), I have not the slightest hesitation in stating that everything is all right.
>
> "Yours faithfully,
>
> "(Signed) A. L. WRIGHT.
>
> "TO THE DIRECTORS OF THE
> "BLUNDER BUS CO., LTD."

This is the strongest testimony that could be adduced in support of the foregoing statements made in this Prospectibus regarding the superiority of the Blunder Bus over every other bus.

In answer to any doubts there might be in the Public Mind, it should be added that the Promoter is not going to give away the Blunder Bus. The following contract has therefore been entered into:—

> The Promoter shall receive the Extraordinary Share for promoting the Company, and he shall take as many of the 999,999 Ordinary Shares as he can get for the Blunder Bus and any future Blunder Buses the Company may purchase.
>
> The Directors will proceed to allotment immediately such a sum has been subscribed as will enable the Promoter to retire from further business, and under no possible circumstances will any subscriptions be returned.

Applications for Shares may be made in any form, and will be as acceptable as unexpected.

Application will be made in due course to the Police for the further protection of the Promoter.

April 1st, 1906.

* * * *

Motoring School for Retired Soldiers.

THE school for teaching time-expired soldiers to become efficient chauffeurs, established by Major Harkness, of the Royal Marine Artillery, at Eastney, to which we have often referred, has proved so successful, and the soldiers have become such excellent drivers, that Major Harkness has now such a number of applications that he will not be able to train all the intending pupils for at least two years. It is satisfactory to learn that the War Office Committee is considering the advisability of organising similar classes at Bulford, Windsor, and London, and the Coldstream Guards have already started a class. The suggestion at present is to select men in their last year of service, so that they will be ready to take posts as soon as they leave the Army.

RACES, RECORDS, AND TRIALS.

Laindon Hill Climb.

THE first competition of the recently formed Essex County Automobile Club was held on Saturday last, when a hill-climb and brake test took place at Laindon Hills, Essex. The competitors attended at Brentwood Station, where the "weighing in" took place at the Great Eastern Railway Station, and they then proceeded to Laindon, a distance of seven miles. The route being indirect, guides had been stationed at the various turnings by the secretary. Perfect weather favoured the event. The whole of the members and their friends were the guests of the Right Hon. Sir Joseph Dimsdale, Bart., to luncheon at his charmingly situated residence, "Goldsmiths," on the hill. It may be mentioned that the view from the house is one of the finest in England, the River Thames can be traced for many miles, and the Crystal Palace plainly seen. About 150 members and friends sat down to a luncheon served in a very lavish manner, after which a hearty vote of thanks, moved by Mr. Burnett Tabrum, J.P., and seconded by Col. W. Nevill Tufnell, for the very great hospitality of Sir Joseph and Lady Dimsdale, was carried with acclamation. This pleasant function over, surrounded by their guests, the genial host and hostess were specially photographed for THE AUTOMOTOR JOURNAL, a copy of which picture forms part of our frontispiece this week.

The Essex County A.C. — The Hon. Secretary, Mr. Lindus Forge.

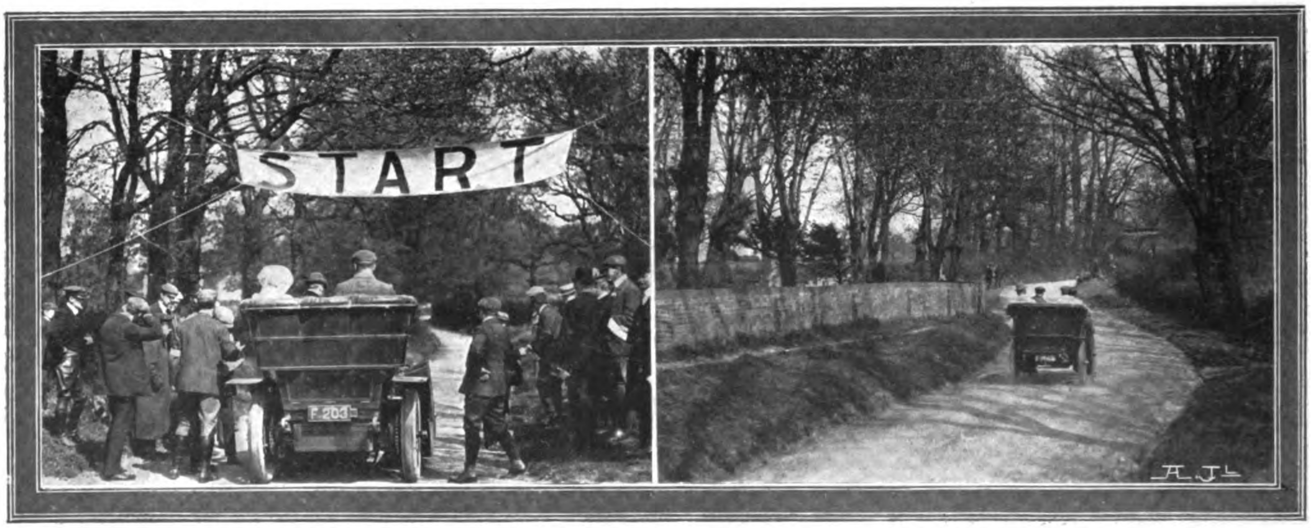
Sir Joseph placed one of his meadows at the foot of the hill at the disposal of the members as an enclosure, and assisted the club in every possible way. The hill climb and brake test competition held under the rules of the A.C.G.B.I. commenced at 2 o'clock, and the whole of the proceedings were ably carried out by the following officials:—

Judge, Colonel W. Nevill Tufnell; Clerks of the Course, Messrs. Launcelot W. Dent and E. A. Serre; Marshals, Messrs. W. Forster, G. Earle, and V. E. Castellan; Timekeepers, Mr. G. N. Finlay, and the Official Timekeepers of the A.C.G.B.I.; Clerk of the Scales, Mr. W. Forster; Starter, Mr. T. Clarkson; Signallers, Messrs. L. C. Clayton and S. Fearn; Secretary of the Meeting, Mr. F. Lindus Forge.

Twenty-six cars had entered the competition, but although thirty-five cars attended the meet, the following only put in an appearance at the start, viz., Sir Charles B. Locock, Bart., 16-h.p Fiat; Miss Edith Miller, 10 h.p. Panhard; Dr. Butler Harris, 15-h.p. Ariel; Messrs. J. Gurney Fowler, 24-h.p. Panhard; Burnett Tabrum, 12-h.p. Wolseley; F. P. Cayley, 6 h.p. De Dion; R. L. Curtis, 7½-h.p. Wolseley; Japh Mason, 10-h.p. Royal Enfield and 26-h.p. Simms Welbeck; J. R. B. Newman, 18-h.p. Mercedes; E. E. Bentall, 8-h.p. Cripto; C. E. Castellan, 24-h.p. Elswick; Arthur J. Mills, 16-h.p. Gladiator; E. E. Bentall, 16 h.p. Richard-Brasier; B. W. Tolhurst, 20-h.p. Lanchester; F. Lindus Forge, 7-h.p. and 14-h.p. Star; Robert Page, 20-h.p. Mercedes.

The Essex County A.C. Hill Climb.—Sir Joseph Dimsdale, who dispensed hospitality to the members and their friends.

A stop and re-start had been arranged half way up, at the steepest part of the hill, having a gradient of one in seven. Cars had to stop, within a marked space of 10 yards, for 30 seconds. The re-starting proved to be a



The starting line. Mr. J. Gurney Fowler's 24-h p. Panhard, driven by Mr. A. F. Field, at the starting tape.

The commencement of the ascent. Mr. Robert Page's 20-h.p. Mercedes taking its turn.

THE ESSEX COUNTY A.C. HILL CLIMB.

Approaching the middle of the hill, where the compulsory stop took place. Dr. Butler Harris' 15-h.p. Ariel.

Mr. Arthur J. Mills's 16-h.p. Gladiator stationary at the compulsory stop point, waiting for the timekeeper's sign to re-start.

THE ESSEX COUNTY A.C. HILL CLIMB.

very severe test, as several cars failed here. After arriving at the finish, the cars returned by another route down into the members' enclosure. The quickest time was made by Captain Newman, on an 18-h.p. Mercedes, and the second best by J. Gurney Fowler, on a 24-h.p. Panhard; but as the competition was a handicap the quickest car is not necessarily the winner. The handicap has not yet been worked out, but will be notified in due course. Many thanks are due for the great assistance rendered by the police both at Brentwood and Laindon.

Welbeck Race Meeting.

Those whose recollection of the weird experiences of the abominable weather which has once or twice been sampled at race meetings on the Clipstone Road is still vivid, had something to be thankful for in the contrast afforded by Saturday last. Albeit boisterous, the weather fortunately remained fine upon this occasion, when the Nottinghamshire Automobile Club again held their meeting on the private road, and the flying kilometre and speed-judging competitions—as given in The Automotor Journal for April 28th—were carried through. The gathering was probably the largest that the club has ever brought together, not only of the general public, but of motorists, who helped to swell the big crowd of enthusiasts who witnessed some of the high-powered cars show their paces. Small cars were considerably in the minority, and so far as speed is concerned the honours were secured, in the scratch event, by Mr. E. W. Wells' 30–40-h.p. Daimler, only a shade of difference being recorded between it and Mr. Frederic Coleman's 18-h.p. White steam car, whilst only 2 secs. divided the first four, and 9 secs. the winner and the sixth car. Altogether there were about 30 cars drawn up to take part in the competitions, and one ingenious statistician calculated these as representing a cash value of over £15,000. In the flying kilometre race for the Wilson Challenge Cup and Gold Medal, limited to standard touring cars, the power, weight, and price of the car were the guiding factors in arriving at the results. The winner in this event is not yet officially announced. 23 of the 30 cars entered competed, and fast times were accomplished by some of the more powerful

Miss Edith Miller on her 10-h.p. Panhard ready to be sent off. Miss Miller was the only lady competitor in the event.

Miss Miller making one of the best re-starts of the day at the compulsory stopping point.

THE ESSEX COUNTY A.C. HILL CLIMB.

machines. In the scratch flying kilometre, out of 23 entries 13 cars took part :—

Flying Kilometre (scratch event) for Gold Medal.

1. E. W. Wells, 30–40-h.p. Daimler.
2. F. Coleman, 18-h.p. White Steam Car.
3. W. H. Hutchinson, 30-h.p. Daimler.
4. J. C. Wilson, 28–36-h.p. Daimler.
5. F. A. Bolton, 30–40-h.p. Daimler.
6. J. A. Doran, 22-h.p. Minerva.
7. C. Johnson, 20-h.p. Rolls-Royce.

— Miss L. B. Starkey, 12–14-h.p. Argyll.
— R. M. Wright, 10–12-h.p. Humber.
— M. Ross Browne, 16-h.p. Minerva.
— T. C. Pullinger, 16–20-h.p. Humber.
— R. L. Jones, 16–20-h.p. Humber.
— M. Ross Browne (No. 2), 15-h.p. Darracq.

In the first of the Speed Judging competitions, confined to the drivers of the cars, there were 24 starters, the announcement of the results again in this case being deferred. In this event the members had to drive their cars over the flying kilometre, and immediately on crossing the finishing line they had to hand to the judges their estimate of the speed, in miles per hour, at which they considered they had covered the distance. Another Speed Judging competition was confined to the public. In this case a car was driven over the course, and any non-automobilist was entitled to make an estimate as to its speed per hour. The results of this are also not yet available.

The whole of the programme, which was carried out very efficiently, obtained its success mainly through the admirable manner in which the officials performed their respective duties, these including the president, Mr. Charles Hardy; marshals, Messrs. E. W. Wells, R. Cripps, W. Don Foster, and G. H. Kirk; timekeepers, Messrs. C. Perry, A. Osborne, J. H. Scothern, and G. E. Butcher; clerks of the course, Messrs. J. C. Wilson, H. Belcher, Hardy Rimington, W. D. Wells, A. Barlow, B. W. Winter, R. Cripps, M. Ross Browne, and J. J. Spencer, and Drs. R. G. Hogarth and J. C. Buckley; and secretary, Mr. Booth Granger.

Novel Test on Harpenden Hill.

In connection with the second run of the season of the North London A.C. on Saturday last, which was to Harpenden, forty-eight members and friends took part. Col. Bowles, the president of the club, presided during refreshments, after which the first of the club competitions took place. This was a test on the hill opposite the George Hotel, the competitors having to start their engine (by starting handle), with front wheels on starting line, mount car, and drive up to a certain point on the hill, then stop the car, change and reverse, return backwards to another specified point, then drive up the hill again to the winning post. The competitor doing the fastest time to be declared the winner. The following were the results :—

1.	Charles Smith ...	12 h p. Darracq ...	49⅕s.
2.	Max Graddon ...	24-h.p. Panhard ...	50s.
3.	Branson Griffiths ...	10–12-h.p. Humber ...	52⅗s.
4.	E. Swingler... ...	8-h.p. De Dion ...	56⅗s.
5.	Geo. Smith	12-h.p. Darracq ...	59s.
6.	R. W. Paul... ...	10-h.p. Wolseley ...	63⅕s.
7.	W. Cornwall ...	16-h.p. Albion ...	66⅗s.

The A.C.G.B.I. 4,000 Miles Tyre Trials.

In connection with the judges' report which was issued last week, the figures which we give below should be recorded, but some explanation should at the same time be given concerning those that relate to the cost per ton-mile of the various tyres? Thus the report not only states that :—

> Each set of tyres was debited with initial cost of covers and tubes put into use, less the estimated value of the remaining "life" of each cover and tube, and plus cost of repairs carried out, plus a small monetary penalty for punctures or bursts.

but it is also pointed out that

> The roads were, for the greater part of the time, in bad condition, being either loose, owing to unrolled metal, or heavy and wet or greasy, owing to frequent rain ;

and that

> In considering the number of covers and tubes used in each class, it must be borne in mind that the 4,000 miles were run without any interval, that therefore the tyres could not be retreaded or repaired, as they would be under ordinary touring conditions, and that consequently a larger number of covers and tubes were brought into use than would be the case normally.

The performance of the Collier tyres was therefore very good, under the circumstances, and the makers are to be congratulated on the enterprising spirit displayed by them in going through with so arduous—and, in some ways, thankless—a trial, in spite of the absence of any competitors.

Table of Weights and Costs.

Class.	Tyre.	Weight of Car.	Miles Run.	Cost per ton-mile in pence.
		tons		
B	815 × 105 beaded edge	1·31	4004	1·90
C	34-in. Collier's	1·58	4092½	2·11
D	36-in. Collier's	2·03	4008	3·08

SCOTTISH RELIABILITY TRIAL—LIST OF ENTRIES—June 13–16.

As the entries have become available for the Scotch Trial we have published them from time to time, and the entry list having closed on the 3rd instant, we are now able to publish the full list of competitors, as officially supplied, divided into classes according to the chassis price. This list comprises no less than 80 cars, which are to participate in what will be probably one of the most trying and important touring car tests of the year.

CLASS A.—*Chassis price not exceeding £200.*

h.p.	Official No.	No. Cyl.	h.p.	Official No.	No. Cyl.
8 Rover ...	... 21	1	9–10 Cadillac ...	... 45	1
6 Rover ...	... 22	1	8 Maxwell ...	... 65	2
9–10 Swift ...	... 25	2	14 Pope Tribune	... 69	2
9–10 Adams-Hewitt ...	41	1	7 Ridley ...	... 78	1

CLASS B.—*Chassis price exceeding £200 to £350.*

h.p.	Official No.	No. Cyl.	h.p.	Official No.	No. Cyl.
16 Albion ...	2	2	10–12 Leader...	... 55	4
12–15 Arrol-Johnston	4	4	16 Maxwell ..	... 66	2
10–12 Humber	... 12	4	10 Alldays ...	... 68	2
10–12 Argyll ...	... 14	2	14 Vulcan ...	... 70	4
10 Darracq ...	... 28	2	12–14 Aster ...	... 75	2
16 Kelvin ...	... 40	4	12–14 Victoria	... 77	4
14–17 Scout ...	... 54	4	16 Reo ...	... 80	2

CLASS C.—*Chassis price exceeding £350 to £500.*

h.p.	Official No.	No. Cyl.	h.p.	Official No.	No. Cyl.
12 Arrol-Johnston	... 5	2	14–20 Vinot ...	.. 42	4
16–20 Humber	... 10	4	16–20 Chenard-Walcker	44	4
15 Darracq ...	... 11	4	18–22 Speedwell	... 49	4
16–20 Sunbeam	... 13	4	14–18 Marchand	... 51	4
12–14 Argyll ...	... 15	4	12–16 Wilson-Pilcher	53	4
14–16 Argyll ...	... 16	4	16–20 Leader ..	... 56	4
16–20 Argyll ...	... 17	4	20–22 Mobile ...	... 57	4
15 Siddeley ...	... 18	4	24 Mass ...	... 61	4
14–22 Germain	... 19	4	12–16 Clement-Talbot	62	4
22 Minerva ...	... 30	4	20 Calthorpe ...	... 72	6
18–24 Courier	... 35	4			
15 De Dion ...	... 37	4			

CLASS D.—*Chassis price exceeding £500 to £650.*

24 Albion	1	4
18 Gladiator	3	4
18 Arrol-Johnston	6	2
24–30 Arrol-Johnston	7	4
25 Siddeley	8	4
24–32 Gladiator	9	4
20–30 Maudslay	20	4
20 Rolls-Royce	23	4
20–32 Darracq	27	4
18–24 Peugeot	29	4
25–30 Iris	32	4
20–30 Enfield	34	4
28 Pipe	36	4
30–36 Drummond	38	4
20–30 Pilain	39	4
30–40 Chenard-Walcker	43	4
25–30 Austin	46	4
24–30 St. Vincent	48	4
28 Ariel-Simplex	50	4
25 Brooke	58	6
20-24 Talbot	71	4
20–24 Horbick	73	4
30 Bell	76	4
28 Spyker	79	4

CLASS E.—*Chassis price exceeding £650.*

30 Rolls-Royce	24	6
30 Daimler	26	4
30–40 Peugeot	31	4
30–40 Humber	33	6
30–40 Martini	47	4
28–36 Armstrong-Whitworth	52	4
25–36 Brasier	59	4
35–45 Ariel Simplex	60	4
24–34 Belsize	63	6
30–40 Belsize	64	4
40 Ariel Simplex	67	6
44 Metallurgique	74	4

IRISH RELIABILITY TRIALS.

THE dates announced for the Reliability Trials and Hill-Climbing Competition of the Irish Automobile Club are June 13th, 14th, 15th, and 16th next. Strangely, these are the identical dates which have now for a very long time been announced as those selected for the Scottish Reliability Trials. Although the Irish trials are mainly intended for amateur Irish drivers and owners, at the same time it was hardly advisable that such a clashing of dates should occur.

The Irish trials are open to touring cars only, and are intended to test reliability and not speed. There are two sections, viz., (1) limited to amateurs, and (2) open. Both sections will be run simultaneously.

In Section I, cars must be the *bona fide* property of amateurs, who must be ordinarily resident in Ireland or members of the Irish A.C., and must be driven by the entrant or a member of his family ordinarily resident in his house. The cars will be divided into the following classes: —

(*a*) Petrol vehicles, the selling price of which does not exceed £200.
(*b*) Petrol vehicles, over £200 to £300.
(*c*) Petrol vehicles, over £300 to £400.
(*d*) Petrol vehicles, over £400 to £550.
(*e*) Petrol vehicles, over £550 to £700.
(*f*) Petrol vehicles, over £700.
(*g*) Steam cars.

The committee may subdivide or amalgamate any of the above classes at a later stage if they deem it desirable.

Entry fee for members will be £1 1*s*., and for non-members £2 2*s*. Double fees after May 23rd up to May 30th. No person will be allowed to enter more than two cars.

The routes will be as follows, starting daily from Dublin :—

First Day, 13th June.—Carlow and back, 99½ miles, *viâ* Naas, Kilcullen, Halverstown Cross, Ballitore, and Castledermot. Minimum time each way, 2h. 52m. ; maximum, 3h. 34m.

Second Day, 14th June.—Dundalk and back. 102 miles, *viâ* Swords, Balbriggan, Drogheda, Dunleer, and Castlebellingham. Minimum time each way, 2h. 56m. ; maximum, 3h. 39m.

Third Day, 15th June.—Gorey and back, 122 miles, *viâ* Little Bray (*viâ* Stillorgan), Kilbride Church, Newtownmountkennedy, Ashford, Rathnew, Glenealy, Rathdrum, Woodenbridge, and Arklow. Minimum time each way, 3h. 18m. ; maximum, 4h. 14m.

All cars must have ordinary touring bodies, and except those having a stated h.p. of 10 or less on the basis of the following formula, must have seating capacity for four adults :—

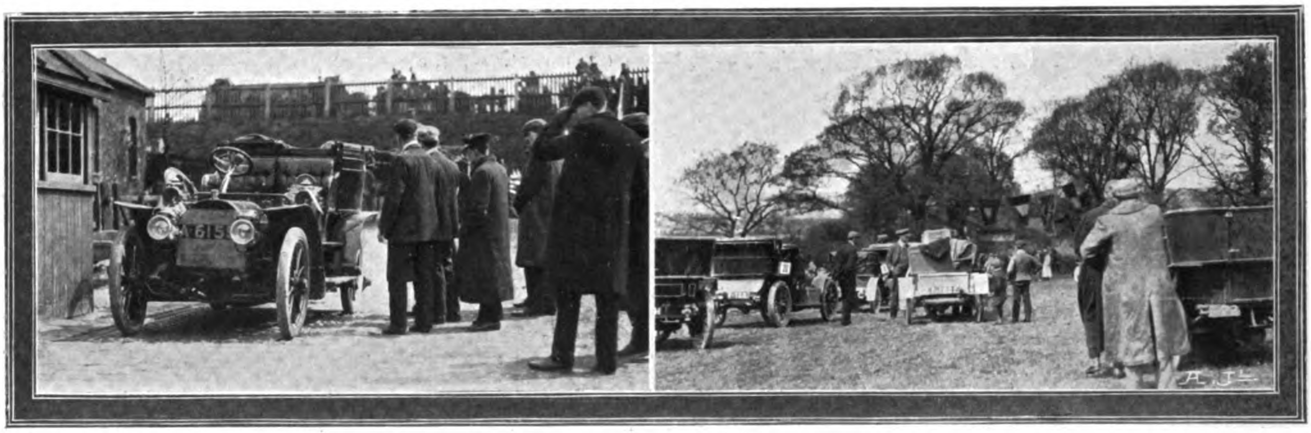
$$\text{Formula :— } \frac{\text{Bore}^2 \times \text{Stroke} \times \text{No. of Cyls.}}{180{,}000}$$

No hired or professional chauffeur or mechanic who has not been *bona fide* in the employment of the entrant for at least one month immediately prior to June 30th, 1906, may be carried as a passenger. An observer will accompany each car, and he may render any assistance in effecting adjustments and repairs along the road. For reliability, a maximum of 300 marks will be given for each day's run, from which will be deducted 1 mark for each minute for which the vehicle is at rest, except for authorised stops or tyre troubles. A minimum and maximum time is allowed for each stage and 1 mark will be deducted per minute either for being before minimum, or after maximum time. In the case of arrival before minimum time the engine must be kept running until the expiration of time or an additional deduction of 5 marks per minute will be made. The place of the hill-climbing competition on June 16th will be duly notified later, and all cars competing in the Reliability Trials must, in order to qualify for an efficiency medal or Challenge Cup, take part in this competition. The

The finishing point. Mr. Japh Mason's 10-h.p. Royal Enfield just rounding the corner.

Looking towards the finishing point. Mr E. E. Bentall's 8-h.p. "Cripto" successfully completing the climb.

THE ESSEX COUNTY A.C. HILL CLIMB.



Weighing the cars at Brentwood Station. A view of the Club Enclosure at Laindon Hills.

THE ESSEX COUNTY A.C. HILL CLIMB.

Hill-Climbing Trial will be open also to cars that have not taken part in the Reliability Trials, on payment of a fee of 10*s.* for each car. Such entries must be made not later than June 13th.

The awards will be an Efficiency Gold Medal in each class to the competitor, the sum of whose marks for reliability, hill-climbing and petrol consumption is the highest on the following basis :—

300 marks per day for reliability, less deductions as provided for stops.

100 marks will be awarded to the car in each class making the best time in the hill-climbing competition, the others being allotted a percentage equivalent to their respective performances.

3 marks will be awarded to the car in each class showing the lowest petrol consumption per ton mile (loaded) over the three days' trial and the others will be allotted a percentage equivalent to their respective consumption per ton mile.

These conditions do not apply to steam cars, for which a separate formula will be applied.

The Goff Challenge Cup is to be awarded to the competitor whose car secures the largest aggregate number of marks for reliability, hill climbing, and petrol consumption. The 300 marks will be awarded for reliability, as before, and the marks for hill climbing will be estimated according to the following formula :—

$$H = \frac{1368\,W\,T}{B^2\,S\,C} + \frac{3}{5}\,T$$

Where H = handicap time, *i.e.*, the time of a "bogie" car placed at scratch, plus the handicap time of the car under consideration; W = weight of car with passengers; T = estimated time "bogie" would take to do the course; B = bore; S = stroke; C = number of cylinders.

$$\text{Marks obtained} = \frac{100 - 40\,(A - H)}{H}$$

Where A = actual time of car; H = handicap time obtained from the foregoing formula.

35 marks will be awarded to the cars, irrespective of class, in like manner as for the Club Efficiency Gold Medal.

Section II. (Open).

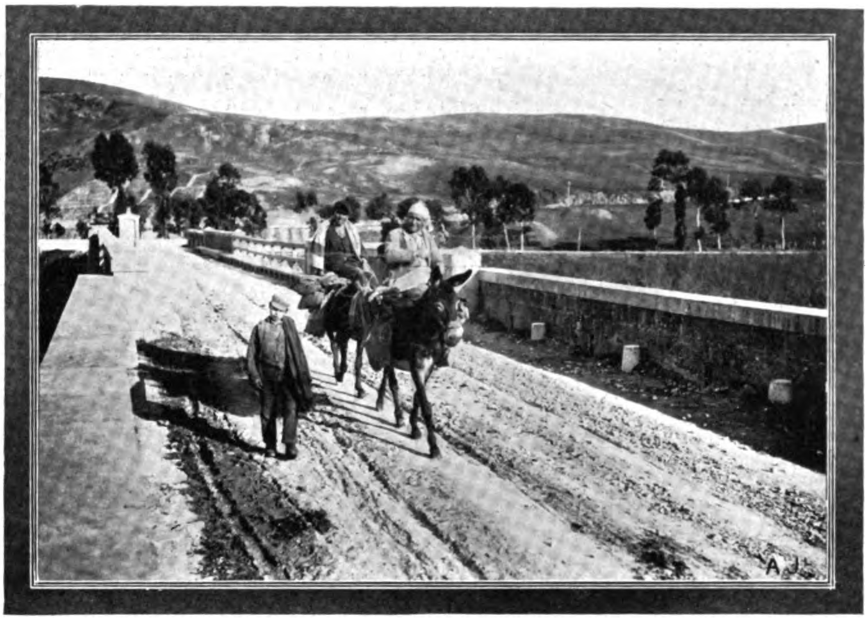
This section will be run simultaneously with Section I., and the same rules mainly will apply, except as to entrance fees, which are £1 1*s.* for members and £3 3*s.* for non-members, and that cars entered in this section only, need not be driven by the entrant or a member of his family. Medals will not be awarded in this section, but certificates will be granted, and, in addition, the "200-Guinea Dunlop Perpetual Challenge Cup" will be awarded to the competitor whose car secures the highest aggregate number of marks for reliability, hill-climbing, and petrol consumption, and the "100-Guinea Dunlop Perpetual Challenge Cup" will be awarded to the competitor whose car secures the next highest marks.

Targa Florio.

CONSIDERING the difficulties attendant upon reaching the scene of this very important race, the number of competitors in the first year's contest can hardly be deemed unsatisfactory. Although over twenty cars had been officially announced as being in the island ready to start, as a matter of fact, only ten came into line in the early hours of Sunday morning last, when this Sicilian event was run off. The starters, their official numbers, and the order of starting were as follows :—1, Lancia (Fiat); 2, Le Blon (Hotchkiss); 3, Cagno (Itala); 4, Ach. Fournier (Bayard-Clement); 5, Bablot (Berliet); 6, Pope (Itala); 7, Maurice Fournier (Bayard-Clement); 8, De Caters (Itala); 9, Rigal (Itala); 10, Grazziani (Itala).

No. 1, Lancia, on a Fiat, was dispatched at 6 a.m., the others following, in rotation, at intervals of 10 minutes each. The risk under these conditions of any unpleasant accidents, considering the length and mountainous nature of the course—a large number of photographs of which have already appeared

THE ESSEX COUNTY A.C. HILL CLIMB.—Mr. Burnett Tabrum, Chairman of the Club.



THE TARGA FLORIO RACE IN SICILY, MAY 6.—One of the island methods of locomotion which the automobile will ultimately displace. Our view is on the course near Cerda.

The day was a triumphant one, nevertheless, for the Itala make of car, as out of the six cars which completed the full course four of them were Italas, they securing respectively 1st, 2nd, 4th, and 5th places, a Berliet car, driven by Bablot, dividing up the four Italian racers by taking 3rd place, Le Blon's Hotchkiss coming in 6th. The arrangements for securing the safety of the public, by guarding the course, were admirably carried out, a large number of carabiniers being requisitioned for the purpose. An enormous concourse of people was drawn to the scene of operations by the novelty of the event, it being stated that from Palermo alone 30,000 special tickets were issued to the public.

The cars were driven the left way round of the course. No accidents of any importance in The Automotor Journal—was reduced to a minimum, as it was rightly estimated that the time which would be occupied upon each tour would probably be rather over than under three hours, an estimate which turned out to be well on the safe side. The total distance of the race is officially stated to be 444 kiloms., the cars going round the course three times.

Place.	Car and Driver and Official No.		Magneto.	Tyres.	Time per Circuit.						Total Time for Three Circuits—444 Kiloms.	Average Kiloms. per Hour.
					Place.	First.	Place.	Second	Place.	Third.		
		No.				h. m. s.		h. m. s.		h. m. s.	h. m. s.	
1	Itala (Cagno)	3	Simms-Bosch	Michelin ...	1	2 50 10	1	3 17 3	1	3 25 9	9 32 22	46·544
2	Itala (Graziani)	10	Simms-Bosch	Michelin ...	6	3 25 12	3	3 9 7	2	3 31 13⅕	10 5 32⅕	43·994
3	Berliet (Bablot)	5	Simms-Bosch	Continental	3	2 56 55	4	3 53 54	3	3 29 16⅕	10 20 5⅕	42·968
4	Itala (Rigal)	9	Simms-Bosch	Michelin ...	5	3 7 27	2	3 12 1	4	4 5 40⅘	10 25 8⅘	42·614
5	Itala (De Caters)... ...	8	Simms-Bosch	Continental	7	3 34 37	5	3 38 26	5	3 25 23⅕	10 38 26⅕	41·727
6	Hotchkiss (Le Blon) ...	2	Eisemann ...	Michelin ...	8	3 45 44	7	3 54 21	6	4 29 18	12 9 23	36·524
—	F.I.A.T. (Lancia) ...	1	Simms-Bosch	Michelin ...	2	2 56 23	6	4 22 3	—	—	—	—
—	Bayard-Clem. (M. Fournier)	7	Eisemann ...	Continental	4	3 6 25⅗	8	4 40 56⅖	—	—	—	—

Splendid weather favoured the meeting, and after Lancia, who was *the* popular driver, had been dispatched, Le Blon was an object of considerable curiosity amongst the general crowd of spectators, from the fact that he drove his car fitted with a four-seated body, and that his wife accompanied him as his mechanician. The only English-speaking driver was Pope, who was in charge of an Itala car, unfortunately, however, not the one which ultimately secured either first or second place.

THE TARGA FLORIO RACE IN SICILY, MAY 6.—Another form of locomotion—one mule power—which the automobile will eventually supersede in Sicily.

were recorded, those cars which dropped out being chiefly placed *hors de combat* through such annoying troubles as running short of petrol, &c.

The Essex County A.C. Hill Climb.—An interested cleric.

Achille Fournier, in the Bayard-Clement, was eliminated on the first round, owing to a collision with a bridge, resulting in a fractured back axle. Pope was the unfortunate who ran out of petrol at Geraci. On the third turn, both Bablot and Rigal got water into their petrol-tanks, and on the same round in the mountains, Lancia discovered that he had been the victim of a leaky petrol tank. In our table we give the times for each of the cars for the circuits which they completed.

It is already announced, in view of the success which the organisers consider the race attained, that it is to be an annual affair, and for 1907 a sum exceeding 100.000 francs in prizes is promised, through the Chevalier Vincenzo Florio.

Tourist Car Trial.

UNDER the auspices of the Forezien A.C., a trial for tourist cars was held, with Saint Etienne as the finishing point, on April 29th and 30th. The distance was 550 kiloms., and 21 cars started in the 8 categories, according to cylinder capacity. The chief results, which were arrived at by taking into consideration average speed, regularity, speed on the hill—points, up to a maximum of 1,200, being given—were as follows:—

Cat. 3 (4 cyl. up to 90 bore).—1. 14-h.p. Bayard-Clement, average speed 53·37 kiloms. per hour, 1,010 points.

Cat. 4 (4 cyl. up to 100 bore).—1. 16-h.p. Berliet, 54·31 kiloms., 1,050 points; 2. 16-h.p. Berliet, 53·47 kiloms., 1,040 points; 3. 18-h.p. Luc Court, 50·75 kiloms., 1,030 points.

Cat. 5 (4 cyl. up to 110 bore).—1. 18-h.p. Mieusset, 50·83 kiloms., 990 points; 2. 18-h.p. Radia, 45·06 kiloms., 940 points.

Cat. 6 (4 cyl. up to 120 bore).—1. 24-h.p. Berliet, 63·18 kiloms., 1,110 points; 2. 24-h.p. Rochet-Schneider, 62·51 kiloms., 1,040 points; 3. 30-h.p. Radia, 60 kiloms., 1,040 points.

First prize was secured by the 24-h p. Berliet car in Cat. 6, the same make of car also securing the first two places in the 4th category.

The Eastbourne Racing Track.

IT is announced that it has been definitely proposed to construct a motor racing track from Eastbourne across the "Crumbles" as far as Pevensey. The length of the track is to be about 7 miles, and is dead level, with the exception of one spot where a road has to be crossed. The end loops, for turning, are to have a diameter of about three-quarters of a mile. The proposed width of the track is 75 ft. throughout, except at the road crossing, where it would be about 45 ft. As a sporting novelty, the idea of a big racing track has always been fascinating, but as a permanent institution, and viewed as an investment, we doubt if there is anything but failure in store for the undertaking.

Two Gallon Efficiency Test.

FROM New York the leading distances covered by the cars in this contest, on May 5, are cabled. Each vehicle was supplied with two gallons of gasoline, and had to run on it as far a distance as possible over a prescribed route, starting from the club garage, up Fifth Avenue, &c., to New Rochelle and on to the Boston Port Road. The longest approximate distances accomplished were:—1. 12-h.p. Franklin, 87 miles; 2. 16-h.p. Frayer-Miller, 48 miles; 3. 20-h.p. Darracq, 46·4 miles; 4. 24-h.p. Berliet, 40 miles.

South Harting Hill Climb.

THIS event, which had been arranged—as was announced in THE AUTOMOTOR JOURNAL last week—to take place on May 12th, has now been postponed to June 23rd.

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MOTOR CYCLING.

Essex Motor Club.

A 150 MILES reliability trial "non-stop" ride for motor cycles is fixed for to-day (Saturday). Only machines of standard pattern in every respect are eligible for entry. The start is at 7 a.m. from the Crown Hotel, Ongar, and follows a 75 miles' route through Chelmsford, Marks Tey, Coggeshall, Braintree, Dunmow, Hockerill, Sawbridgeworth, Harlow, and Epping back to Ongar. After lunch this route will be repeated the reverse way. For each 75 miles, minimum time allowed 4 hours, maximum 4¼ hours.

During the first round times will be taken of all competing vehicles over a measured distance (1 mile on private road). During the second round times will be taken over a measured course of 220 yards of all competing vehicles, the speed of which must not exceed 12 miles per hour, the engine to be kept firing regularly the whole distance. The greatest difference in miles per hour between the top speed made in the one mile and the slowest done in the 220 yards will determine the result of each competitor's performance, and marks given accordingly.

No pedalling will be allowed, and failure to keep the engine running will disqualify.

Passenger vehicles must be driven in these tests on the top gear and the clutch not to be slipped.

Lyons Hill Climb.

ON May 6th, the Lyons Motocycle Club carried out a hill climb for motor cycles over a distance of 3·7 kiloms. on the Cheres-Limonest Hill. The chief results were:—

Cat. 1 (2-h.p.).—1. Alcyon, 5 mins. 12⅕ secs.; 2. Giet (1½-h-p.), 6 mins. 16 secs.; 3. Terrot (1¼-h.p.), 6 mins. 25 secs.

Cat. 2 (3-h.p.).—1. Magnat-Debon (2¼-h.p.), 3 mins. 51⅖ secs.; 2. Alcyon (2¾-h.p.), 5 mins. 0⅖ sec.; 3. Alcyon (2¾-h.p.), 5 mins. 44 secs.

Cat. 3 (3½-h.p.).—1. Peugeot, 4 mins. 7⅘ secs.; 2. Peugeot, 5 mins. 18 secs.; 3. Alcyon, 5 mins. 23 secs.

Cat. 4 (5-h.p.).—*Dead Heat:* Two Peugeots, 3 mins. 58 secs.

Racing machines: 1. Givaudan (6-h.p.), 3 mins. 15⅗ secs.; 2. Givaudan (6-h.p.), 3 mins. 31⅕ secs.; 3. Terrot (4½-h p.), 3 mins. 40⅗ secs.

The Essex County A.C. Hill Climb. — Mr. T. Clarkson, who manipulated the starting flag.

North London A.C.

THE president, Col. Bowles, has expressed his intention of entertaining the members and their friends at Forty Hall, Enfield, on the 26th inst.

The "Gamage Cup" competition will take place on the 19th.

MOTOR BOATING.

British Motor Boat Club Opening Meet at Kingston.—The motor fleet at Nuthall's.

Pearl of the Mediterranean.

Owing to the strikes in France it has been decided to postpone this motor boating event, which consists of a circular tour round Sicily.

Motor Fishing Boats in Iceland.

Reikjavik (the capital of Iceland) is hardly the sort of place one associates with modern progress and motor-boatism. Nevertheless motor fishing boats have been introduced, and are doing good work on the coasting fisheries, where they have been in use for some two years, some of them having even been built in Iceland, the majority of the remainder being imported from Denmark. Go on sleeping, good old England!

Missionary Motor Boats.

The Rev. R. Griffiths, Chaplain of the Medway Branch of the Missions to Seamen, has ordered a 17 ft. carvel-built open launch, fitted with a 5-h.p. "Truscott" motor, for use as mission tender, and to give greater boarding facilities in bad weather and against strong tides.

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AERONAUTICS.

Wellman Expedition.

Mr. Wellman is evidently quite determined to get to the North Pole, for if his airship is unsuccessful in accomplishing the feat, he is preparing two motor sledges to carry him across the Arctic ice. The horse-power of these vehicles is comparatively small, being only 6-h.p., presumably on account of the object of reducing the necessary amount of fuel on separate tractors which draw the laden sledges after them. The weight of the tractors is carried on runners shaped like those of ordinary sledges, and they are provided each with a large broad wheel studded with projecting spikes. The two tractors, which weigh 225 lbs. each, will be expected to draw 5 sledges between them, and if anything happens to the airship, the expedition will proceed on the motor-drawn sledges.

More About the Airship.

Mr. Wellman himself, whom we were fortunate enough to see recently at the Warwick Trading Company's premises, gave us a few further particulars in regard to his airship. Special attention, we understand, has been paid to the guide-rope, which is to be provided with a cigar-shaped steel drum at its lower end, which will float on any water encountered, and so prevent the end of the guide-rope from sinking below the surface. We do not, however, remember that M. Santos-Dumont ever employed anything of this kind, though he had made a number of successful flights over the Bay of Monaco, guide-roping on nearly every occasion. Circumstances, however, are probably different in Arctic regions, where of course the end of the guide-rope may be frequently called upon to leave the water and travel over ice, but whether the steel cylinder would be advantageous under the latter circumstance is a point which only experience can prove. The airship, it will be remembered, which, as we have already stated, resembles a cross between the Santos-Dumont and Lebaudy machines, will have both a tractor and propeller, being driven by 55-h.p. and 25-h.p. Turgan engines respectively, the weight of which is estimated at about 10 lbs. per horse-power. If everything goes well with the airship it is hoped that it may accomplish the journey in from seven to fifteen days, though, of course, any such estimate is highly speculative. An interesting feature of the expedition is that the De Forest Wireless Telegraph Company are sending a representative whose duty it will be to maintain wireless communication with the steamer "Frithjof," which will remain at the base at Spitzbergen. From this point news will be sent to Hammerfest in the same way, and thence to the newspapers. Provided, therefore, that the wireless telegraphy apparatus keeps working, we shall, whatever happens to Mr. Wellman, at least be able to form some opinion as to how far he penetrated.

CLUBS AND ASSOCIATIONS.

A.C.G.B.I.

THE next examination in London for the club's driving and mechanical proficiency certificates is fixed for Wednesday, May 16th. Applications to attend should reach the secretary, 119, Piccadilly, at least four clear days before that date.

Aero Club.

AT the third club ascent from the Crystal Palace in the Aero Club balloon "Vivienne III.," Mr. C. F. Pollock in charge, the Hon. C. S. Rolls gave chase in a 6-cylinder Rolls-Royce, and eventually located the ballooning party at Strood, Kent, where they had descended.

New members elected include Lady Bowen, the Hon. Assheton Harbord, and the Hon. Mrs. Assheton Harbord.

Prof. A. K. Huntington, who is one of the English pilots chosen for the Gordon-Bennett (Aeronautical) Cup Race, has decided to call the balloon which he is building especially for the race, the "Zephyr."

British Motor Boat Club.

THE opening cruise of the British Motor Boat Club was carried out on Saturday last in very favourable weather, but, owing to lack of organisation, the proceedings fell somewhat flat. The start was timed for 4 p.m., but it was considerably after this hour before Mr. J. Stirling's "Elgiva," which had been selected as the flagship for the occasion, with the commodore of the club, Admiral Sir William Kennedy, and the vice-commodore on board, cast off from Nuthall's and headed for Hampton Court Bridge, followed by quite a large fleet of motor craft. According to the programme, the commodore's flagship was to have been "hove to" below Tatham's Island, while the other launches saluted by dipping their ensigns, but when the time came for this interesting ceremony she had disappeared, and the query was echoed from boat to boat "Where's the commodore?" By the time the "Elgiva" had been sighted again the salute had been forgotten, and a dash was made for the landing-stage at Nuthall's.

Among the large number of motor boat enthusiasts present with their boats were the Rear-Commodore, Mr. Miall Green (Fulsked), Mr. Oswald B. Colls (Fleurette), Mr. A. G. Fentiman (Javelin), Mr. J. W. Stocks (De Dion), J. S. Holmes (Bouton). "Napier Major" was kindly placed at the disposal of the Committee as Press boat, and convoyed the fleet during the cruise.

As on the last occasion, dinner formed the concluding function of the meeting, Sir Wm. Kennedy occupying the chair. In the course of the evening several well-known motorists referred in their speeches to the progress of the Club, and wished it every prosperity during the coming season.

Hertfordshire County A.C.

FIXTURES arranged in the near future by the Club are:—

May 19th.—50 miles members' Consumption Trial for cars and motor cycles.

June 4th.—Whit-Monday. Run to Cambridge, visit colleges under the guidance of Rev. A. J. McKinney.

June 16th.—Balloon ascent.

June 30th.—Open Hill Climb for cars, Aston Hill.

Hertfordshire County A.C.

THE club run to Cambridge, on Whit Monday, it is hoped, will be largely attended, as the Rev. A. J. McKinney is acting as guide to the college and district.

The open hill-climb for cars at Aston Hill, near Tring, on June 30th, which has now become an annual institution, promises to be well patronised by motorists from different parts of the country.

Marine Motor Association.

THE secretary of the Marine Motor Association wishes to call the attention of motor boat owners to the new rules regarding the number flags of motor boats. Every boat racing this season must be entered in the Association's Register of motor vessels, and will have a racing number allotted to her. Application for numbers should be made to the secretary, 47, Leadenhall Street, E.C., as early as possible.

The Motor Union.

THE Motor Union have elected Sir Alex. Henderson, Bart., as a vice-president of the Union, and Mr. W. H. Pryor, of Stevenage, and Mr. D. Colville, J.P., of Motherwell, life members.

The Rev. F. W. Hassard Short and Mr. J. Duncan Hindley have been appointed representatives of the Motor Union upon the Council of the Auto-Cycle Club.

Messrs. Lindsey Renton and Henry Bowler have been elected additional representatives of the individual members upon the General Committee of the Union.

Motor Union Meet at Birmingham.

THE meeting of the General Committee of the Motor Union at Birmingham on Saturday, May 26th, will be made the occasion of an inter-club meet. The Midland Automobile Club, who are the hosts of the Union on this occasion, have determined to make the gathering a big success, and have arranged a varied and attractive programme. On the preceding Friday members will have the opportunity of viewing works typical of the British motor industry, as the Daimler, Wolseley, and Lanchester Motor Companies have thrown open their factories to inspection. The committee meeting will be held at the Grand Hotel on the Saturday morning, to be followed by a luncheon. A gymkhana in aid of the funds of the Moseley Convalescent Hospital has been arranged to take place in the grounds of Moseley Hall in the afternoon, when a variety of competitions has been arranged. The combined dinner of the Motor Union and the Midland Automobile Club will be held at the Grand Hotel commencing at 7.30 p.m.

The Roads Improvement Association, Incorporated.

AT the annual meeting of the Roads Improvement Association held last week, at 1, Albemarle Street, Piccadilly, W., Mr. Robert Todd, who took the chair, in moving the adoption of the annual report, dwelt at length upon the "dust question," which is being taken up very seriously by the Association. He said it was very difficult to convince local highway authorities that a good road was cheaper than a bad one. It might cost a little more to construct in the first instance, but the cost of maintenance would be reduced to a minimum, and, moreover, a properly-made road was practically dustless. The fault was to be found in the use of improper binding materials. Too much mud and dirt were used by the majority of road-makers.

The Right Hon. Earl Cadogan, K.G., was re-elected the president of the Association. Other officers elected were the Hon. Arthur Stanley, M.P., vice-president; Mr. Robert Todd, chairman; Mr. W. Worby Beaumont, M.Inst.C.E., vice-chairman; and Mr. W. Rees Jeffreys, hon. secretary and treasurer.

Sheffield A.C.

THE hill-climbing competitions have been fixed for Saturday, June 16th, when, in addition to the usual Challenge Cup events, there will be a special competition for members not connected with the Trade.

A run for crippled children is another fixture of the committee on Saturday, July 14th, when they hope they will have the hearty co-operation of all members in the club's endeavour to give these unfortunate little ones a special treat.

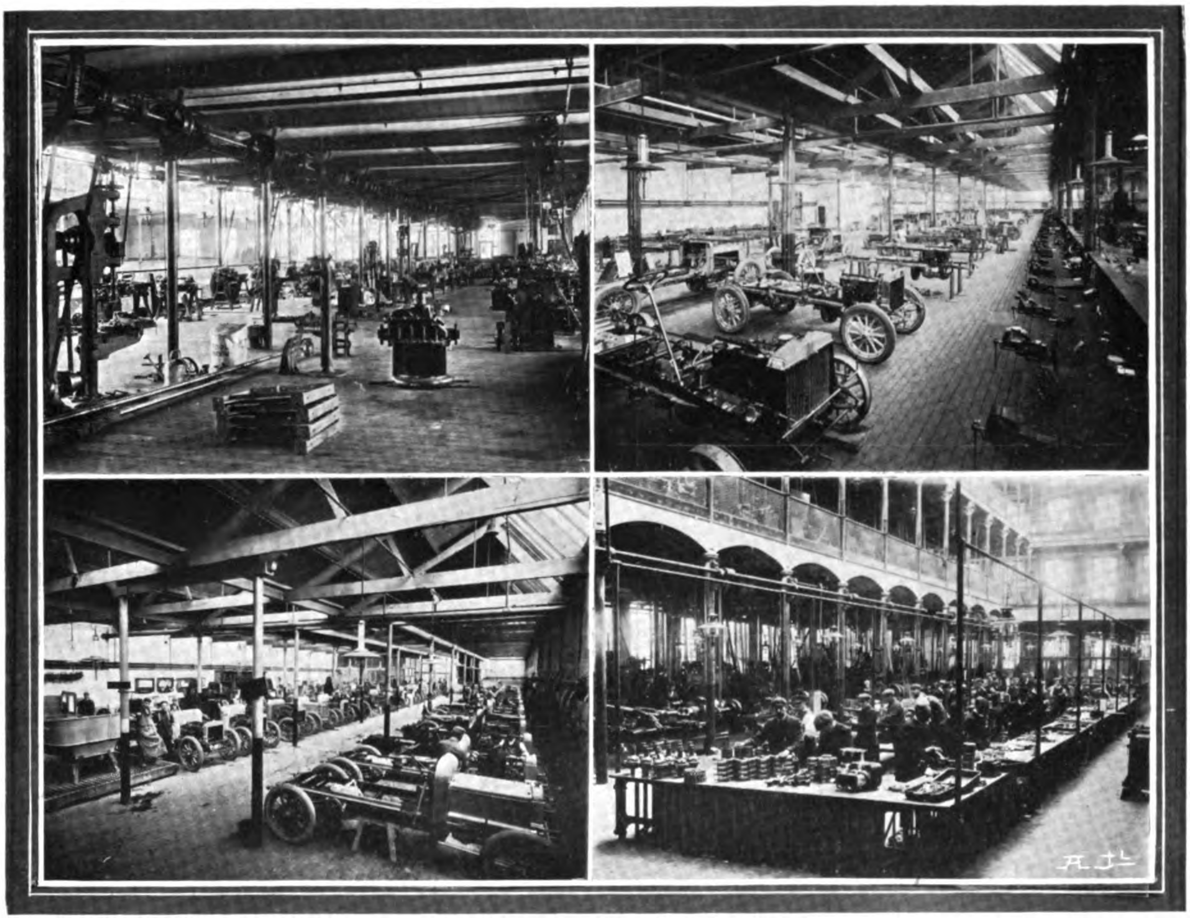
To avoid the dust, the meeting place in club fixtures in many instances is the destination of the run. This has been arranged by the committee with the view of avoiding, as far as possible, inconvenience to the public from the dust of a string of vehicles running over the same road, as most of the places fixed can be reached by several different routes.

* * * *

A Tragic Coincidence.

BY a coincidence, which possesses about it something almost of the weird, another fatal motor accident has occurred at Markyate, in which a car belonging to Mr. Charles Wilding Preston came into collision with a cart at the cross-roads some little distance outside the village. The car, which is said to have been travelling fast, ran into the horse drawing the cart, nearly severing one of the unfortunate animal's legs. Horace Pedder, who was driving it, was badly injured, and Mr. Preston sustained injuries to which—after uttering in a low tone the words, "Are we to blame?"—he shortly afterwards expired. The chauffeur, Albert Edward Carter, who was driving the car, and who himself suffered injuries to the head, has been charged with manslaughter, and is at present remanded on bail.

DAIMLER PROGRESS.

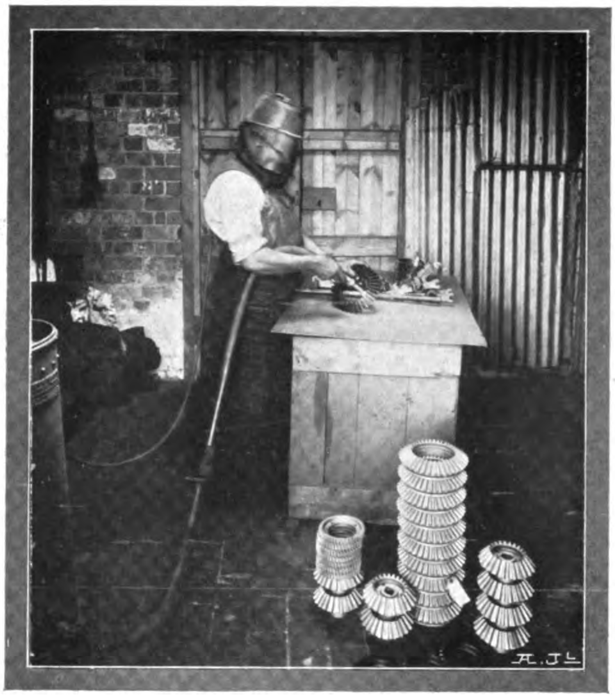


The Daimler Motor Co. (1904) (Ltd.) Works.—Views of some of the splendid shops from which the famous Coventry-Daimler Cars are turned out. 1. The Tool Room. 2. The Erecting Shop. 3. Chassis Painting Room. 4. The Inspecting Table. This latter department occupies the centre ground floor of the old M.M.C. four-floor building, from which the Daimler Company cut out the centre, and by building a centre span glass roof, have converted it into a model factory building, both in respect to light and ventilation.

WEDNESDAY in last week will be likely to live as a memorable date in the history of the automobile movement. On that occasion the Daimler Company took occasion to demonstrate to some 200 guests, whom they had especially invited to Coventry, that there is at any rate one great company in this country in possession of a works in which every modern development, both in shop organisation and management, on what may really be regarded as a colossal scale, for the manufacture of high-powered and highly-priced automobiles of the most perfect reliability and finish. The inspection of the works provided a triumphant demonstration that there are British manufacturers who, no longer content to follow, may justly claim to lead, and there is probably no British automobilist who does not derive the sincerest satisfaction from the recognition of this important fact.

The 200 guests duly assembled at Euston Station a little before 9.30, when the special corridor train chartered by the directors started for Coventry. On arrival at the motor car city (late the cycle city) the company were entertained at lunch. To the toast of the King, a happy touch was added by the chairman, Mr. E. Manville, who described King Edward as " the foremost amongst motorists, and most distinguished of the patrons of British motor cars," and he followed the toast up by a highly instructive speech, dealing mainly with the causes which had gradually led to the splendidly triumphant present position of the company, over which he so ably presides.

Before this function, the workshops were inspected by the guests, a large number of whom were in a position to appreciate, with the pleasure of experts, the splendid organisation and management displayed. As an illustration which will perhaps bring home to our readers more forcibly than anything else the great extent of the present works, it may be mentioned that the old M.M.C. works has been completely absorbed into the present Daimler works, of which it now forms only, it may be said, a wing. With characteristic energy the building, which was formerly very wanting in air and light, has been improved by the Daimler Company, by the construction of an enormous well extending from the bottom to the top of the interior of the building and roofed with glass, which affords admirable light and ventilation to all the different floors. It was not, however, the mere extent of the works which formed their most impressive feature. That was provided by the concentrated vigour and energy which (doubtless owing to



The Daimler Motor Co. (1904) (Ltd.), Works.—The Man in the Iron Mask. Sand-blasting.

the admirable bonus system adopted by the directors) characterised, it might be said, almost every movement of every workman engaged. This sort of thing, as experienced people know, is more eloquent of the real prosperity of an undertaking than any words or statistics can be, though it must not be forgotten that at the present time the company is turning out some twenty-four to twenty-six high-powered, that is to sav, 28 to 40-h.p. cars per week, an output which is not being equalled by any other firm in the world.

* * * *

PUBLICATIONS RECEIVED.

The Little Guides. East Riding, Yorks. By J. E. Morris, B.A. London: Methuen and Co. 2*s.* 6*d.* net.

The Little Guides. Northamptonshire. By Wakeling Dry. London: Methuen and Co. Price, 2*s.* 6*d.* net.

Krausz's Practical Automobile Dictionary. By Sigmund Krausz. New York: F. A. Stokes and Co.

The Yachting Monthly (*Illustrated*). No. 1, Vol. L. May, 1906. London: Horace Cox, Windsor House, Bream's Buildings, E.C. Price, 1*s.* net.

"*Roadside Troubles.*" *Handbook of the Automobile.* By Charles E. Duryea. New York: American Motor League, Vanderbilt Building. Price, $1.

"*The Queen*" *Newspaper Book of Travel. A Guide to Home and Foreign Resorts*, 1906. London: Horace Cox. Price, 2*s.* 6*d.*

Ordnance Survey Map. Sheet 17. *South of Scotland.* London: Board of Agriculture, 4, Whitehall Place, S.W. Price, 1*s.*, 1*s.* 6*d.*, and 2*s.*

Ordnance Survey Map. Sheets 1, 2, 3, 4. *Part of North of England.* London: Board of Agriculture. Price, 1*s.*, 1*s.* 6*d.*, and 2*s.*

Catalogues.

The Brooke Motors. Motor Boats. J. W. Brooke and Co. (Ltd.), Lowestoft.

Thornycroft Touring Cars. John I. Thornycroft and Co. (Ltd), Chiswick.

Peto and Radford (*Ltd.*), *May*, 1906. 55, Hatton Garden, W.C.

Cycle Lamps. Powell and Hanmer (Ltd.), Chester Street, Birmingham.

The "*Rapid*" *Car.* Straker and MacConnell (Ltd.), 20, Avonmore Road, Kensington, W.

CORRESPONDENCE.

****The name and address of the writer* (*not necessarily for publication*) MUST *in all cases accompany letters intended for insertion, or containing queries.*

"DOGBERRY ONCE MORE."

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I quite agree with your paragraph headed "Dogberry once more" in your issue of the 21st inst.

I represented Mr. Frank Doughty, the defendant in the case, the defence being that, although his car was signalled on the trap, the time taken was that of another car, which was leading for some yards.

I cross-examined the police constables as to whether the car in question had a canopy and glass front, and, upon pressing the question, they all swore that it had neither.

I handed a photograph of the car up to the Bench with a canopy and glass front, to show its state when it was stopped, and, after looking at it, the chairman stated that it was very improper to attempt to confuse by producing such a photograph, and were unanimous that it ought not to have been brought into the case.

I still persisted that the state of the car at the time was very material to the defendant's case, and that he could call witnesses, and that the photograph was not intended to mislead in any way whatever.

The chairman also stated that, as the offence took place a month previous, the police could not be expected to remember and, notwithstanding this extraordinary statement, needless to say the defendant was convicted and not even given the benefit of the doubt.

I am, dear Sir,
Yours truly,
WM. TAYLOR PARKES.

18, Fleet Street, E.C., April 28th.

THE WORK OF THE AUTOMOBILE ASSOCIATION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Many conflicting interpretations have been placed upon the decision of our special meeting at the Cordingley Exhibition. I therefore ask your indulgence to explain that although our warnings in reference to speed will for the present be extended to all drivers, there are innumerable other advantages which must and will be confined to members.

Patrols are under orders to ignore queries shouted by non-members from passing cars. This practice is objectionable, and on occasions rather embarrassing. Our subscribers know how to obtain their requirements, and either the brass car badge or the membership card is their passport. Further, with our confidential bureau scheme it is possible for members (only) to drive through districts in which there are no A.A. scouts, and still comply with the law of speed limit in places where the police in ambush invite its infringement.

Even as our organisation has been used unblushingly, and criticised superfluously by the motoring deadhead, so may we expect an avalanche of enquiries as to how all this is done. To all of which I am directed to reply that "the subscription is two guineas per annum, the Automobile Association's offices are at 18, Fleet Street, and the secretary is

"Your obedient servant,
April 26th. "STENSON COOKE."

* * * *

Manchester Corporation Motor 'Buses.

NEXT month it is announced by Alderman Wainwright, Chairman of the Tramways Committee, motor 'buses will be running in the Northenden and Didsbury district.

The Dust Evil

Is being descanted on by medical officers throughout the kingdom, and an official in that position in Glastonbury, Somerset, attributes the prevalence of influenza and similar diseases to the germ-laden dust raised by motor cars passing through the town. A dust-infuriated District Councillor of Scarborough also recently declared that it was no use farmers breeding horses as they could not sell them, and that there was no use growing oats or anything else. His conclusion is that motor cars should be abolished.

Petrol, Steam, or Electricity.

A CONSIDERABLE number of articles, and a large amount of correspondence (due in the first instance to the action taken by THE AUTOMOTOR JOURNAL, in connection with the "Electrobus" promotion) have appeared recently in the daily Press, on the relative merits of steam, electricity, and petrol, as furnishing propulsive power for 'buses. Amongst these articles was included a comprehensive summary of the situation by Mr. Mervyn O'Gorman in the columns of the *Daily Mail*, the appearance of which was followed by another article from Mr. W. H. Davy, who appeared as an out and out advocate of the merits of the steam car, and traversed several of Mr. O'Gorman's statements with, it must be admitted, rather more energy than accuracy. Mr. O'Gorman replied to Mr. Davy with so admirable an example of the "retort courteous" that we make no apology for reproducing his observations, as follows:—

> "It is human to err, but a form of error naturally unpleasing to me is the imputation of 'unfairness' and 'entirely misleading statements' to Mr. Mervyn O'Gorman. I therefore challenge Mr. W. H. Davy to make good his words.
>
> "He has, apparently, the merit of extreme youth, and the springtime has acted upon him so that he rushes naked into the fray, fortified with a war-whoop and brandishing his emphasis.
>
> "Where I said a steam omnibus was less noisy than a petrol one, he says it is *absolutely* noiseless—really?
>
> "Where I said it was self-starting several degrees more easily than the petrol omnibus, he says it starts and stops without any shocks.
>
> "Where I said it can use the cheapest fuel, paraffin, and compare it to petrol, 'which is highly inflammable,' he says that the steam car's boiler and fuel are *perfectly* safe—really?
>
> "In conclusion, I would say that I am sorry that Mr. Davy is suffering from so severe a cold, and trust he will soon be better. Then he will be able to reconsider his assertion that steam cars have *no* objectionable smell when driven with kerosene."

The Electrobus Flotation.

IT is a source for much congratulation that the effect produced by the action of THE AUTOMOTOR JOURNAL in regard to this flotation is likely to result in the shareholders obtaining a return of the moneys subscribed and for which such hurried allotments were made by the directors. The following paragraphs, which appeared it the *Daily Mail* of Tuesday last, sum up the situation very pithily:—

> "It was rumoured yesterday that the action of the Electrobus directors in offering to cancel allotments and return subscriptions in numerous cases was to be followed by a general circular to the shareholders asking them whether they wished to go on or not. Should such a circular be issued, we can only give the same advice as to those individuals to whom the offer of return of subscriptions has been made. Nothing must be done unless its legality is undoubted. For this reason we have assured ourselves as to the course being taken by the three very important groups of shareholders who are represented by Messrs. Michael Abrahams and Company and Messrs. Simmons and Simmons, and also by Messrs. Corbould-Ellis and Mitchell, who represent possibly the largest individual number of dissentient shareholders.
>
> "The two former groups are not accepting the offer without reference to the Court, and applications will be made on Friday next. The third group will also be in Court on Friday in connection with the injunction (restraining the directors from forfeiture or dealing with moneys subscribed by shareholders) already referred to. If individual shareholders privately accept the offer made they would seem likely to render themselves liable in case of a liquidation for the liquidator to call upon them to pay in order to meet any deficiencies up to the amount of their holding. It is just possible, therefore, that they might find themselves financial losers to benefit other people who have taken legal precautions. The best thing that shareholders can do in this matter is to leave it entirely in the hands of their solicitors, and on no account to settle privately. The directors have got themselves in a terrible muddle, and if they wish to get out of it they must do it in proper legal form."

"Horse Causes Motor Smash."

OUR readers will perhaps hardly believe it, but this heading has actually appeared in a daily paper in reference to a case in which an accident occurred between a motor car and a horse-drawn vehicle, which was fully and solely due to the illconsidered action of the horses concerned. In spite of this fact, however, such an occurrence even a few months ago would have been headed in large type "A Motor Car Smash." So the times move after all. The accident to which the heading referred took place on the Bath Road at Calcott, near Reading. A motor car was slowly passing a miller's wagon, drawn by two horses tandem, when the leading horse swerved right across the road, and compelled the driver of the car, out of humanity to the horse, to run the car on to the bank, where he collided with a telegraph pole, causing the motor car to he overturned. All the occupants were thrown out, but fortunately no one was seriously hurt.

A Very Serious Local Scandal.

WE have often heard the suggestion put forward by various local bodies who dislike paying for the upkeep of their roads, and who are almost invariably hostile to the automobile, that the motor car movement might be successfully combated by refusing to roll the roads when fresh road metal is placed upon them. This method, in fact, was adopted by the district council at Helstone, and was successful for the time being in driving the motor omnibuses introduced by the Great Western Railway Company off the roads. The same charming method of revenging themselves upon the new locomotion has been adopted by the Carmarthenshire County Council, who have completely, or almost completely, suspended, we are informed, the use of the steam roller, with the result that great lengths of their roads have become a wilderness of untamed road metal over which hardly anything can be propelled. This delightful propaganda has been really too successful, local doctors and other automobilists having entirely to give up the use of their cars, while in many instances they have sold them off, and the hum of the motor is no longer heard on the Carmarthenshire roads. This, no doubt, is precisely what the Carmarthenshire County Council wanted, but unfortunately the roads have become to all intents and purposes as impassable for horse-drawn traffic as for automobiles, and the horse owners, who doubtless smiled at first, are now breaking forth into remonstrances and maledictions. Under the circumstances they will probably approve of the action of the Motor Union, which as Mr. Rees Jeffreys pointed out in a recent speech, has taken up the question energetically and is prepared to guarantee as much as £300 towards a fund for starting legal proceedings, while it will head the list of subscriptions for this purpose with a donation of £25. The Roads Improvement Association, too, is giving £10, and the Union proposes to raise £150 in London, leaving the same amount to be subscribed for by aggrieved parties in South Wales. The Motor Union has placed all the necessary papers bearing on the subject, and a report by Mr. Howard Humphreys, before Mr. Danckwerts, K.C., and if he advises that there is a good case, legal proceedings to compel the Carmarthenshire County Council to bring its roads into a proper condition will be commenced.

J.P., Not M.P.

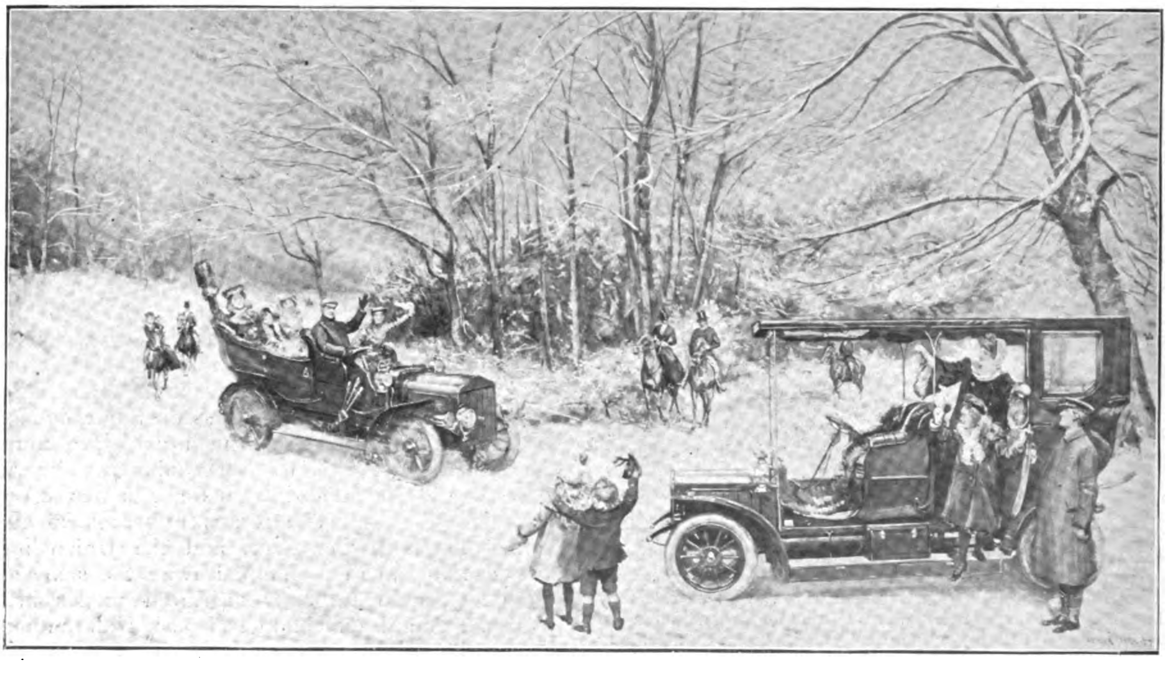
Mr. James Taylor, whose Swift car we illustrated in our last issue, should have been given as "J.P.," instead of "M.P.," as stated under the photograph.

Dripping Oil Attracts Attention.

The superfluity of lubricating oil from motor 'buses is threatening to become a very serious nuisance, not only through causing smoky exhaust, but by the extent to which it is, with no justification whatever, permitted to leak out of motor omnibuses, particularly at their usual stopping places. We have already referred to the extent to which ladies are very rightly complaining of the injury done to their dresses and "frocks." Now it appears, as pointed out by the Holborn Borough Surveyor, that it is having a very destructive effect upon the asphalte pavement. Wood it perhaps does not injure very much, except in so far as it attacks the pitch with which the blocks are set, and possibly dissolves out some of the creosote, while making the surface slippery. But asphalte it seems in a number of cases to have thoroughly softened through, a result which is not to be wondered at when it is borne in mind that as far as its chemical composition is concerned, asphalte is practically identical with pitch. This sort of thing is, after all, mere negligence and silly waste. It certainly does the 'bus companies no good whatever to run their lubricating oil, which is an expensive item, out on to the streets. Really more care in construction and management will have to be taken if the motor 'bus is to avoid seeing arrayed against it a great amount of justifiable indignation. Action in the matter is being taken by the Works Committee of the Holborn Borough Council, who are proceeding to communicate with the Commissioner of Police and the London County Council on the question.

To Promote Considerate Driving.

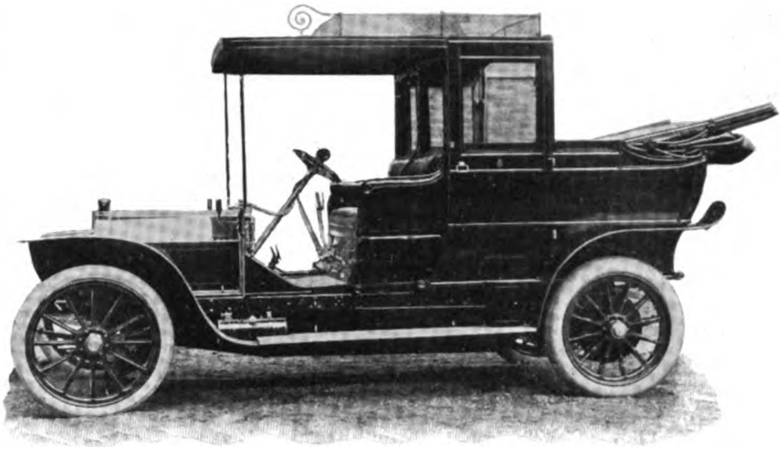
While many leading men who own cars at one end of the scale are doing their utmost to promote the cause of careful driving amongst car owners, our leading manufacturers are recognising the importance of impressing the principles of consideration for other road users on all who are entrusted with the driving of their vehicles. Not long ago we drew attention to the excellent rules and regulations drawn up to this end by Mr. S. F. Edge. It is pleasing to be now able to add that the Arrol-Johnston Company have adopted a somewhat similar set of maxims which they enforce on all their employees on pain of dismissal. Briefly, it may be said, that the Arrol-Johnston rules, if adhered to universally, would render motorists the most popular people in the Kingdom, instead of being viewed, as they often are, with—well, other feelings. We cannot afford space to quote these rules in full, but a few examples to show the spirit in which they are drawn up may be cited. After careful instructions as to how corners and crossings should be taken, special consideration in regard to pedestrians and drivers of horse-drawn vehicles is inculcated. "If pedestrians," say the rules, "in crossing the road, show signs of undue fear, pull up at once." "Though drivers of horses may be in the wrong, pull up and show them every consideration, even to leading the horse past the car if necessary." And to this a very pregnant observation is added, that "in the present state of popular prejudice, accidents must be avoided at all costs; and however unjust it may be to the motorist, it is useless at present to insist on due and proper rights." When such excellent precepts are effectively assimilated by drivers generally, we may anticipate a revival of the courtesies of the road, which made travelling in the eighteenth century so picturesque.



Recently we mentioned a very charming picture which had been painted by Mr. Arthur Garratt depicting a "White" day in the Park. We have now, by the courtesy of Mr. Frederic Coleman, received a delightful photogravure of this picture, a reproduction of which appears above. We understand from Mr. Coleman that he will be happy to send to any owner of a White steam car a copy of this photogravure, which measures about 26 inches by 16 inches, upon application to him. Non-owners of White cars can also obtain one of these pictures, although a nominal charge has been deemed advisable, to prevent too great a rush upon Mr. Coleman's resources.

Motorists' Tribute to the King of Spain.

AMONG the festivities which, in connection with the wedding of King Alfonso and Princess Ena, will make "Old Madrid" probably the gayest place in Europe at the end of May, will be a procession of Spanish automobilists to the Prado Palace, where they will be reviewed by Princess Ena. The King of Spain has been such an enthusiastic automobilist that the tribute thus offered by his Spanish comrades in the pastime is particularly pleasing. Already the King of Spain has made a long automobile trip during his present visit to this country, journeying up to London, by way of historic Winchester, from the Isle of Wight last week on his Daimler car—of which British make he has no less than three in constant use.



His Majesty the King's Mercedes Car, which has been fitted with a new limousine landaulette body by Hooper and Co.

L'Obligeance d'un Roi.

HIS Most Catholic Majesty has a most charming way of doing things, particularly of conferring his favours, and this very naturally enormously increases the extent to which they are appreciated by those who receive them. T.R.H. Princess Henry of Battenberg and Princess Ena recently drove from London to Southampton by road to meet King Alfonso, and returned with him to the Metropolis. The 40-h.p. Delaunay-Belleville car which was employed by the Royal party for the journey, was in charge of the company's driver, George Edward West. The King was most favourably impressed by the careful way in which he looked after his future Queen and her exalted mother, and the precision with which at his hands the journey was carried out, rivalling, indeed, an express train in regularity of running. As a mark of his royal recognition and appreciation, King Alfonso, at the end of the journey, bestowed on West the Spanish order of *Isabella la Catolica*, an honour which naturally is very greatly appreciated by the driver, as well it may be.

What Motor Licences Bring to the Revenue.

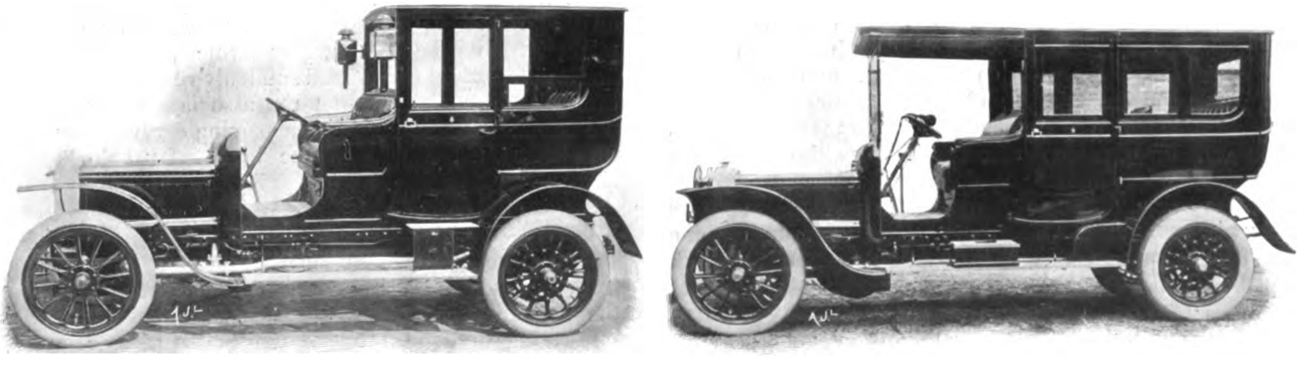
THE total amount paid in licences for all motor vehicles during the year 1905, was stated to be £61,967 by the Chancellor of the Exchequer, replying to the question of Colonel Long, M.P., in the House last week.

A Royal Driver.

WE learn on good authority that His Royal Highness Prince Henry of Prussia, is likely personally to drive his 60-h.p. Benz car in the Herkomer contest.

A Garrulous Coroner.

THE deputy coroner, Mr. A. W. Wyatt, who recently conducted an inquest on the death of Mr. Frederick Hills, a butcher, who was run over by a motor 'bus in the Walworth Road, loves not the motor 'bus. Mr. Hills was performing a complicated series of gymnastics, designed to transport his person across the crowded thoroughfare of Walworth Road. These included grabbing hold of the hand-rail of a moving tramcar and ultimately making a dive under the wheels of an approaching motor 'bus, which latter proved fatal. The motor 'bus was only going about five miles an hour. Mr. Hills was not observed by the driver until the latter felt a jerk. The driver of the 'bus was exonerated by the jury from all blame, and a verdict of accidental death returned, but the deputy-coroner during the proceedings delivered a regular tirade against the motor omnibus generally, which he declared "went whirling and banging about the place at 25 miles an hour," adding that "railway crossings were a playground to them." If some enthusiastic person some day starts a "Society for the Discouragement of Irrelevant Loquacity amongst Coroners," Mr. Wyatt will perhaps note that his observations have not been made in vain.



Two new Daimler Cars just completed for H.R.H. the Prince of Wales. The bodies are "Hooper" brougham and limousine, respectively.

Fines on the Easy Instalment Principle.

PROVIDED the Surrey authorities extract the money from the automobilist they are not, to do them justice, apparently in a violent hurry to get it. Recently, a young driver of the Talbot Company was trapped, summoned, "dealt with according to law," and, as the police have it, "duly" convicted and fined to the tune of £10 by the Guildford Bench, and given a month to pay it in. At the end of the month he wrote explaining that he was unable to raise the money, and offering to pay in small weekly instalments. Much to his surprise, the police authorities promptly accepted the offer.

One Month "Without the Option."

THE Ilford County Bench last week passed a sentence of one month's imprisonment in the second division on Thomas Carpenter, for driving a motor car furiously at Shalford Common. The offence for which this punishment was inflicted, consisted of driving at high speed—37½ miles an hour according to Inspector Jennings—and refusing to stop when several times called upon to do so by Policeman Knight. Carpenter, against whom several previous convictions were proved, it was alleged, instead of stopping or even slowing down, called out to the policeman, "No, no! Get out of the way, or I'll be over you," and the policeman had to yield. Under the circumstances, it would not appear that the offender is being very harshly dealt with.

Another Monte Carlo Trip.

AT this time of the year the Riviera is particularly attractive, and no more delightful way of getting there can be imagined than to go by motor car. The Hon. C. S. Rolls and Mr. Percy Northey are just about to make the trip, and the occasion will be made the opportunity for comparing the merits of the new 20-h.p. Rolls-Royce car, destined to take part in this year's Tourist Trophy, with the 1905 model which did so well last year. A comparative run of this nature should afford excellent facilities for obtaining useful information, and the Royce firm are to be congratulated on having one of their cars ready at such an exceptionally early date.

Cost of Running a 10-12-h.p. Argyll Car.

IN connection with the scheme by which the London Argyll Company encourage drivers of their cars to study economical running, the first to gain the £5 prize and the certificate has been the driver of a 10–12-h.p. vehicle, which is the property of a firm in the city, and has been used by their travellers chiefly in London. Since November 20th last, and up to March 31st, the distance traversed has been 5,192 miles, during which time the expenditure has been only £25 11*s.* 3*d.* (petrol £11 7*s.* 2*d.*, lubricating oils £3 4*s.* 3*d.*, renewals £2 9*s.* 10*d.*, repairs and adjustments £6 16*s.* 6*d.*, and sundries £1 13*s.* 6*d.*), whereas the sum of £42 was that specified as the maximum permissible expenditure by the Argyll Company for this sized vehicle. In other words, the running expenses have been no more than 1·181 pence per mile, and the fuel consumption has been but one gallon for each 16·74 miles. The driver reports that he has not once been laid up on the road, and that the tyres are still in good condition. We are also informed that several other drivers, both of twin-cylinder and 4-cylinder Argyll cars, have nearly completed their 5,000 miles, and bid fair to show similarly good records.

Beware!

A NEW police motor trap has been located just a mile the London side of Epping, between Epping and the "Wake Arms," where a stretch of 440 yards has been measured out by the police. Another trap in operation just now is on the Aylesbury Road, between the 27th and 31st milestones between Little Berkhamsted and Ashton Clinton.

The Multitudinousness of a Modern Car.

Apropos of the complaint sometimes made that the up-to-date automobile is abnormally expensive, Mr. S. F. Edge points out, for the benefit of those who are troubled by this mistaken prepossession, that when we consider the number of finished parts which have to be put together to construct, for example, a 24-h.p. Napier chassis, the wonder is, not that it costs what it does, but that it can be sold for the money. Altogether there are no less than 7,049 separate and individual parts which have to be assembled together before the Napier chassis is complete.

A New Bournemouth Resort.

ON the south coast the motorist is ever welcome, and in most cases well catered for. Bournemouth is particularly favourable in this respect. Mr. H. R. Willats, who for many years was the genial host at the Margate Cliftonville Hotel, has now, in addition to controlling the splendid Canford Cliffs Hotel at Bournemouth, added another palatial hostelry to the town—the Norfolk Hotel. Mr. Willats is proverbial for his good treatment of motorists, and, needless to say, every provision has been made both here, as at the Canford Cliffs establishment, for the tourist. The Norfolk stands in its own grounds of about 1½ acres, and is, moreover, within easy reach of the Meyrick Golf Links and the Square.

To Attract the Horse.

THE propaganda in favour of scented petrol as a means of getting rid of the noxious odour disseminated by some motor cars and many motor 'buses is being pushed with energy, and a pony—doubtless in the pay of the syndicate, or whatever body is dealing with the invention—has been discovered who kicks up his heels and a tremendous rumpus whenever he smells ordinary petrol exhaust, but displays an almost pathetic docility when his nostrils inhale a scented product. Someone is, accordingly, suggesting that the inventor might carry his principle still further, and not confine himself to a method of merely diffusing heliotrope odours from the exhaust pipe. "Freshly mown hay" and "clover blossom" are suggested as likely to produce a most pleasing and exhilarating effect on any horses or ponies passed, though that scheme might have its dangers also, as farmers, astonished by finding an ancient quadruped suddenly running away with them, might not realise that the associations evoked by the odours diffused from some passing car had mounted with unwonted energy to the brain of usually docile Dobbin.

Lubricating Oil the Real Trouble.

THE scent business, however, suffers in principle from one serious defect. It is, as a matter of fact, not the petrol which causes the unpleasantness, but the lubricating oil, and the invention that is really required is not something to deodorise the petrol exhaust, but to deodorise or counteract the fumes of partially burnt lubricating liquid.

Royal Favours.

THEIR last day in France together was spent by the King and Queen at Marseilles, the greater part of the time being occupied in visiting the curiosities of the modern Phocea. As was the case on the occasion or their previous visit, De Dietrich cars were placed at their disposal. Rougier, the famous French driver, who piloted the Royal car, was presented by King Edward with a handsome souvenir.

Germain Chainless Cars.

THE Germain cars are acquiring so large a circle of admirers, not to say devotees, that the appearance of "Hints on the Germain Chainless Car" will be hailed with satisfaction by many. The hints which Captain Masui gives are in a highly condensed form, and are rendered comprehensible by being accompanied by a very clear plan of the vehicle.

A Theologico-Political Motor Simile.

THE Bishop of Manchester, speaking on that eternal "Education" Bill at Wimbledon recently, said, in reply to Mr. Morley's contention that the Unionists were trying to get back to office on the shoulders of the bishops, that a fair retort would be that the present Government rode triumphantly into office in a trailer attached to Dr. Clifford's motor car.

Relief for Alcohol.

CONSIDERING all the discussion which has taken place on the subject, and the great advantages which would result from such a course, it is satisfactory to learn that there is a probability of Mr. Asquith introducing a special Bill to give a legislative effect to the recommendations made by the Industrial Committee which sat on this subject last year. We trust that the hope that there will be but little opposition to the Bill may prove correct.

BRITISH EXPORTS AND IMPORTS OF MOTOR CARS, &c., FOR 1906.

NOTE.—In our issue for January 13th, 1906, we published in one table the full figures of British Exports and Imports for 1902, 1903, 1904, and 1905. Prior to 1902, motor cars were not classified separately.

1906.	Imports.					
	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.
		£	£		£	£
January ...	458	175,270	136,720	114	2,889	1,989
February...	530	211,824	184,598	130	3,507	1,511
March ...	600	230,887	184,763	258	7,440	3,556
April ...	591	224,639	178,590	303	8,774	2,895
Total...	2,179	842,620	684,671	805	22,610	9,951

Popular Police Trap.

THE county of Huntingdon provides an object lesson in the evils resulting from allowing the fines collected from automobilists to be used in relief of the *local* rates. No less than £428 has been contributed as the result of last year's fines to the relief of the local rates, which they diminish to the amount of a halfpenny in the £.

White Cars in the San Francisco Earthquake.

OUR readers will not be surprised to learn that a considerable number of White cars belonging to the San Francisco branch of the Company were during the terrible time in San Francisco constantly in use, carrying dead, wounded, and dynamite as long as they were able to obtain fuel. From Mr. Walter White, who is at present in San Francisco, we learn that the loss to the company is quite enormous, both their sewing-machine and automobile places of business being entirely destroyed. They were building a new garage which, fortunately, had not got beyond the foundation stage, and they are now removing their headquarters to Oakland, where they have a branch.

COMMERCIAL POINTS.

Mr. W. Geo. Williams.

NEXT week Mr. Williams, who is so well known in the motor world in connection with his work for the Collier Tyre Company, joins the Deasy Motor Car Manufacturing Company, Ltd., whose works are at Coventry. We wish Mr. Williams further successes in his new sphere. His recent performance in driving in the 4,000 Miles Tyre Trial of the A.C.G.B.I. for the Collier Tyre Company, and securing the gold medal for the company, is a gratifying "wind-up" to his association with the Collier Company.

Speedwell Expansion.

A COMPANY, to be known as "The New Speedwell Motor Company, Limited," has, we learn, been formed, with a capital of £50,000, specially to manufacture Speedwell Cars, at Chiswick, W.; and that the new company will absorb the present Speedwell Company. The bulk of the new share capital is being supplied by the directors of the new company, the balance being offered privately to friends and clients of the original company. We further understand that there will be no public issue, and that the British cars will not be ready before the November Show.

Motor Fittings.

SMALL parts, such as axle caps, cocks, and lubricators, &c., are a branch of motor engineering in themselves, for few builders of cars can spare the space for their manufacture now that they can be obtained from firms who give their sole attention to the production of such articles. Among such companies is the old established firm of the Aston Brass and Engineering Company, who have for some time been catering for the motor trade. It is a branch of manufacture in which they are well qualified, on account of their experience, to give satisfaction to those who place their orders with them.

THE Swift car driven by Major Babington, with which he won the Indian Trials and secured the cup, was, we learn, fitted with Dunlop tyres.

1906.	Exports, British and Irish make.								Foreign and Colonial Re-exportation.					
	No. of Cars and Value.		Parts Value.	*B.S. Africa.	No. of Motor Cycles and Value.		Parts Value.	*B.S. Africa.	No. of Cars and Value.		Parts Value.	No. of Cycles and Value.		Parts Value.
		£	£	£		£	£	£		£	£		£	£
January ...	146	48,759	16,334	6,825	84	2,112	2,211	637	68	26,999	9,582	4	205	355
February ...	72	19,493	19,838	5,642	44	1,298	1,980	288	39	19,688	5,840	2	65	201
March ...	89	31,814	22,940	4,712	66	2,469	2,372	801	56	28,373	8,203	8	277	420
April ...	62	23,645	16,747	965	61	1,948	2,590	584	83	27,264	11,919	9	292	336
Total .	369	123,711	75,859	18,144	255	7,827	9,153	2,310	246	102,324	35,544	23	839	1,312

* *Included* in the totals of Cars, Cycles, and Parts.

CAPTAIN W. BYRON and Mr. J. A. Doran, of the Midland Counties Motor Garage Company, have ordered twelve 4 and 6-cylinder Rolls-Royce cars.

THE sole agents for the Benz cars for Great Britain, Ireland and the Colonies are the Cannstatt Automobile Supply Association, 34, Shaftesbury Avenue, W.

LORD DE RAMSEY has just obtained his second Napier car, a 40-h.p. 6-cylinder touring carriage, and Sir Charles Tennant, who at the commencement of this year took delivery of a 40-h.p. 6-cylinder Napier, has just arranged for the building of a 60-h.p. 6-cylinder carriage of the same type.

SWIFT cars made a big show at the recent Toronto Exhibition in Canada, where six of these popular vehicles were staged. We understand that the Swift Company are already doing a satisfactory business in Canada with their latest designed models, and intend, as far as possible, to secure their share of our colony's orders in the automobile world.

MR. J. HARGREAVES has secured a 6-cylinder 40-50-h.p. Hotchkiss car to keep his 25-29-h.p. Landaulette of the same make company.

IN his recent record drive from London to Monte Carlo, Mr. Charles Jarrott used Coventry chains on his 40-h.p. car. In fact, we learn from the Coventry Chain Company, Limited, that no other pattern of chain is now fitted to any of the Crossley cars by Mr. Jarrott, he believing them "to be the best."

POLICE COURT REPORTS.

Infringing Sparking Plugs Rights.

MESSRS. COCKS (LTD.), motor accessory dealers, of Great Eastern Street, E.C., were this week summoned at Marylebone, for selling sparking plugs so nearly resembling those made by De Dion Bouton et Cie, of Paris, as to cause deception. These plugs, it was stated, were sold at the rate of 1*s.* 11½*d.* each, as against 2*s.* 5*d.* charged for those of the prosecutors. After evidence had been heard, the magistrates fined the defendants £20, with £70 costs. Intimation of appeal was given.

COMPANY DOINGS.

Ten Per Cent. for Shareholders of Argyll Motors, Limited.

AN interim dividend on the ordinary shares of the company for the half year ending March 31st, at the rate of 10 per cent. per annum, is announced by the directors of Argyll Motors, Limited, payable on May 15th. The usual 6 per cent. dividend on the preference shares is payable on the same date.

NEW COMPANIES REGISTERED.

Birmingham Electrobus Co. (Ltd.).—Capital, £100 in £1 shares. Objects, same as in Manchester Electrobus Co., Ltd. (*q.v.*).

Lancashire and Yorkshire Electrobus Co. (Ltd.).—Capital, £100 in £1 shares. Objects, same as in Manchester Electrobus Co., Ltd. (*q.v.*).

Liverpool Electrobus Co. (Ltd.).—Capital, £100 in £1 shares. Objects, same as in Manchester Electrobus Co., Ltd. (*q.v.*).

London Daimler Co. (Ltd.), 1, Broad Street Place, E.C.—Capital, £1,000 in £1 shares.

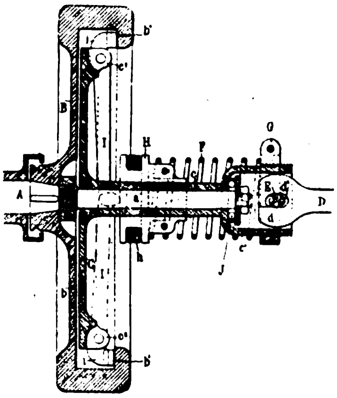
Manchester Electrobus Co. (Ltd.).—Capital, £100 in £1 shares. Objects, to adopt an agreement with the X Electric Accumulator Company, Ltd., and to carry on the business of motor omnibus and vehicle proprietors, &c.

Mercedes Daimler Omnibus Co., Coventry (Ltd.), 1, Broad Street Place, E.C.—Capital, £1,000 in £1 shares.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

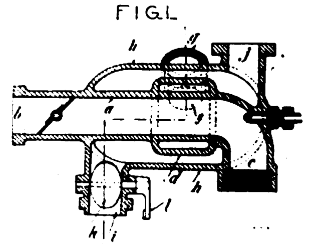
The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

3761. 15th February, 1906. An Improved Metal to Metal Friction Clutch. Maurice Sizaire, Georges Sizaire, and Louis Naudin, all of 24, Rue Godefroy, Puteaux, France. Date under International Convention, 31st March, 1905. This invention relates to an improved metal to metal friction clutch, constructed more particularly with a view to use with transmission gears applied to explosion engines, such, for example, as automobile vehicles. There is one drawing—an elevation. Upon the shaft, A, of the motor is keyed a plate or disc, B (the driver), which forms part of the fly-wheel. This plate forms at its face, *b*, one of the friction surfaces for the clutch. Upon an extension, *a*, of this shaft, A, is mounted a sleeve, *c*, terminating at one extremity in an enlarged part, c^1, and having at its other end a plate or disc, C, which forms the other friction surface (the follower), and is intended to make contact with the face, *b*, of the plate, B. The enlarged part of the plate, C, and of the sleeve, *c*, c^1, is joined to the driven shaft, D. In the construction illustrated the propeller-shaft, D, ends in a rounded head, *d*, permitting a slight deviation of this shaft, which is necessary in the case of the transmission gear of an automobile carriage. It is furnished with a slotted eye, d^1, through which passes the pin, E, connecting this shaft, D, and the part C *c* c^1. Upon the sleeve, *c* c^1, is arranged a spring, F, of which the pressure causes the necessary contact between the plates, B and C. This spring, F, is mounted between a collar, G, fixed on the enlarged part, c^1, of the sleeve, *c* c^1, and a sliding collar, H, situated upon the sleeve, *c*. This sliding collar, H, is connected to the clutch operating device—for example, the clutch pedal. *h*, is the collar, or a trunnioned ring, to which is fitted the controlling fork. The plate, *c*, is furnished with two pairs of ears or lugs, c^2, carrying pivots upon which are mounted two levers, I *i*, I *i*, placed one on either side of, and parallel to, a diameter of the plate, C. The arms, I *i*, one on each side of the pivots, c^2, are of unequal length, the arm, I, being much longer than the arm, *i*. The longer arms, I, bear at their extremities against the end of the socket, H, and the small arms, *i*, bear against the inner face of a flange, b^1, of the plate or fly-wheel. The sleeve, C *c* c^1, bears at the bottom or innermost portion of its part c^1, against a shoulder which is formed at the end of the shaft, A *a*, by means of an interposed ring of balls, J. The longitudinal displacement of the part, C *c* c^1, does not affect this ball bearing, because this displacement is extremely small and does not reach one millimetre. When the sliding socket, H, is left free, and the spring, F, which bears against the collar, G, can freely exert its pressure; it acts by means of the socket, H, upon the long arms, I, of the levers I *i*. These levers bear at the end of their small arms, *i*, against the inner face of the flange, b^1, of the plate or fly-wheel, and push the plate, C (the follower), against the plate, B (the driver), applying it against the latter with a pressure which depends upon the strength of the spring, F, and the proportion of the arms of the levers, I *i*, and by this pressure the clutch is engaged by the simple contact of the metallic plates, C and B. In order to disengage this friction clutch the socket, H, is brought rearwards, compressing the spring, and thus causing it to cease to thrust on the lever, I *i*.—April 18th, 1906.



995. 13th January, 1906. Improvements in Vaporisers for Combustible Liquids for Use with Explosion Motors. Léopold Gautreau and Théophile Gautreau, both of 7, Rue de Chateaudan, Paris. Date under International Convention, 14th January, 1905. The object of this invention is an improved vaporiser for slightly volatile combustible liquids, such as heavy petrol, mineral oils, alcohol, etc., which allows of utilising these liquids in practice for feeding explosion motors, and even allows of directly starting motors with these liquids, without having recourse to light essences. There are five figures. Fig. 1 is a longitudinal section. The vaporiser comprises a tube, *a*, one end, *b*, of which is connected to the suction-port of the motor, the other end, *c*, receiving the mixture of air and combustible liquid. The tube, *a*, is surrounded by a jacket, *d*, so that between the latter and the tube an annular space is formed, which communicates with the outer atmosphere at one end by means of a nozzle, *f*, and at the other end by means of an uptake, *g*. The whole is enclosed in an external jacket, *h*, communicating by means of the tube, *i*, with the exhaust-port of the motor and by means of the tube, *j*, with the atmosphere, so that the exhaust products from the motor circulate between the tube, *a*, and the jacket, *h*. The quantity of exhaust-gas is regulated by means of a valve, *k*, controlled from the exterior by means of the rod, *l*. This allows of regulating the heating of the tube, *a*, according to the nature of the combustible liquid used. Within the nozzle, *f*, there is arranged any suitable source of heat, such as a burner or lamp, which heats the tube, *a*, at the moment of starting the motor. When this tube has been sufficiently heated, and the motor is worked by hand in the usual manner, the suction causes the mixture of air and liquid combustible to enter the tube, *a*. On coming into contact with the hot walls the liquid is volatilised and mixed with the air, and the mixture of vapour and air enters the motor. As soon as the motor has been started and the tube, *a*, is heated by the exhaust-gases circulating between *a* and *h*, it becomes unnecessary to use the source of heat in the nozzle, *f*, and the supply of heat therefrom can be reduced or discontinued. Within the vaporiser to which this invention relates, the nozzle, *f*, in which the "starting" heater acts does not communicate with the jacket in which the exhaust gases from the motor circulate. This construction obviates all additional manipulation at the moment of starting the motor, and allows of causing the heating-burner to act as long as is necessary, even when the motor has begun to work.—April 18th, 1906.

FIG I.



The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

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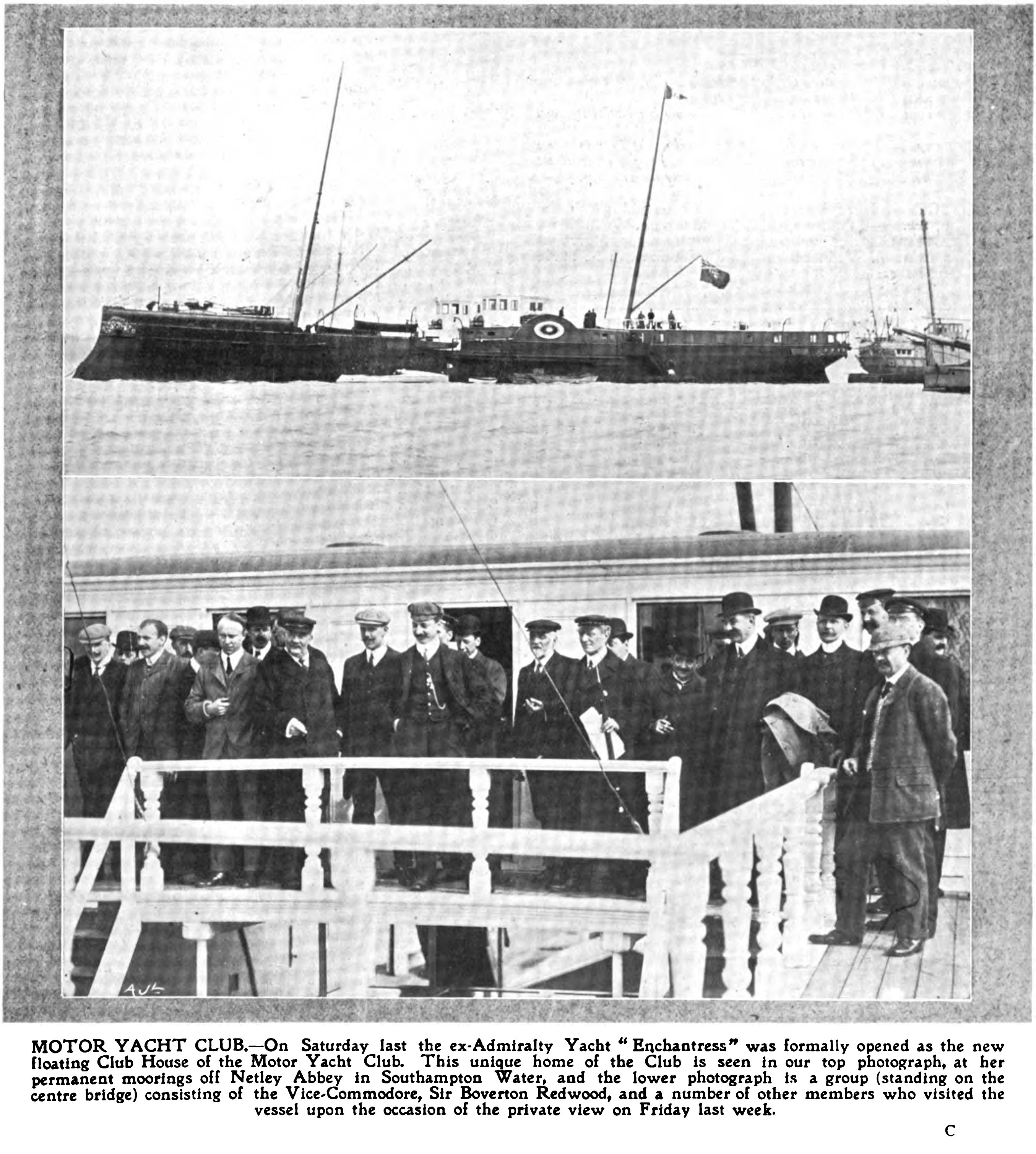

MOTOR YACHT CLUB.—On Saturday last the ex-Admiralty Yacht "Enchantress" was formally opened as the new floating Club House of the Motor Yacht Club. This unique home of the Club is seen in our top photograph, at her permanent moorings off Netley Abbey in Southampton Water, and the lower photograph is a group (standing on the centre bridge) consisting of the Vice-Commodore, Sir Boverton Redwood, and a number of other members who visited the vessel upon the occasion of the private view on Friday last week.

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DIARY OF FORTHCOMING EVENTS.

◆

British Events.

May 24	...	Frome's Hill Climb (Herefordshire A.C.).
May 26	...	Motor Union Meeting (Birmingham).
May 26	...	Petrol Consumption Trials (Wolverhampton A.C.).
June 9	...	Hill-Climb (S. Herts A.C.).
June 11-16	...	Land's End to John O'Groat's (Auto Cycle Club).
June 13-16	...	Scottish Reliability Trial.
June 13-16	...	Irish Reliability Trials (Irish A.C.).
June 16	...	Grindleford Hill Climb (Sheffield A.C.).
June 23	...	South Harting Hill Climb.
June 30	...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July	...	Motor Yacht Club Reliability Trials.
July 2	...	Hill Climb (Wolverhampton A.C.).
July 5	...	Gymkhana at Wadslay Bridge (Sheffield A.C.).
July 14	...	Run for Crippled Children (Sheffield A.C.).
July 14	...	"Henry Edmunds" Hill Climb.
July 21	...	Motor Union Meeting (Bath).
Aug.	...	*Van Trials.
Aug. 6-18	...	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8	...	International Cup (Motor Boats) Eliminating Race.
Aug. 9	...	International Cup (Motor Boat) Race at Ryde.
Sept. 22	...	Motor Union Meeting (York).
Sept. 27	...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

May 14-31	...	Milan Reliability Trial.
May 22-June 3		Tour de France (Motor Cycles and Voiturettes).
May 27	...	Motor Bicycle Championship (Moto Club de France).
June 4	...	Rochet-Schneider Cup (Auvergne Circuit).
June 6-13	...	Herkomer Cup.
June 17	...	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26-27	...	Grand Prix (A.C. de F.).
June 28-29	...	Kiel Motor Boat Races.
July 8	...	Motor Bicycle International Cup Race (Austria).
July 14-17	...	Ostende Meeting.
July 15	...	Mont Cenis Climb (Turin A.C.).
July 26-Aug. 15		Circuit Européen.
Aug. 13	...	Ardennes Circuit.
Aug. 18	...	Coupe de Liedekerke (Belgium A.C.).
Aug. 26-Sept. 2		Brescia Week (Italian A.C.).
Sept. 10	...	Florio Cup Race (Italy).
Sept. 15-16	...	Mont Ventoux Hill-Climb.
Sept. 20	...	Lake Major Motor Boat Races.
Oct. 5-14	...	Leipzig Exhibition.
Oct. 6	...	Vanderbilt Cup Race.

* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

Keeping the Motor 'Bus in Order. The future of passenger transport by motor 'bus depends to such a large extent on the good behaviour of the motor 'buses, that those who have the true interests of the movement at heart cannot avoid sympathising to a very large extent with the action which the police in the Metropolis are taking to induce those who are responsible for their management to abate the annoyance that *some* of the motor 'buses, at present plying, occasion to the public. The same approval will doubtless be extended to the action of certain of the members of the Holborn Borough Council who, at a recent meeting, drew attention to the noise and lubricating-oil nuisances, and suggested that police action should be taken, adding that if that was not effective, recourse should be had to Parliament. We think, on the whole, that the police are fully discharging their duties in the matter, and certainly the powers with which they are already armed seem to be adequate, as already nearly a dozen omnibuses have had their licences rescinded by reason of undue noise and other misdemeanours. The police in the Metropolis are not, however, acting precipitately or vindictively. On the contrary, it must be recognised that the chief authorities at Scotland Yard have been and are wisely disposed to treat the new locomotion with a certain amount of indulgence. After all, if the motor 'bus on some occasions annoys the dwellers in houses, and people on the pavement, it must not be forgotten that it has proved itself an enormous boon to the community generally, and any initial troubles will undoubtedly right themselves in time.

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The Electric Tram and Motor 'Bus. In almost every way the admirable paper recently read by Mr. E. Manville before the Automobile Club on the relative merits and capabilities of the electric tram and the motor 'bus, will be regarded as epoch-making in the literary history of the traction question. Not only was the occasion the first on which the good qualities of the motor 'bus received adequate recognition from the electric tram expert, but some very useful data were put on record for future reference. In addition, the paper and the discussion did a great deal to clear the air, and to remind a good many of us who were in danger of forgetting the fact, that the conditions of traffic of this kind in the Metropolis are altogether abnormal, and that the relative advantages of electric tram and motor 'bus are not everywhere cast on the same lines as they are in London. For these reasons, amongst others, we devoted at the time a good deal of space to Mr. Manville's paper, and to the consideration of the discussion by which it was followed. Mr. Manville has now replied to the discussion, and has dealt with the various points raised by his critics. As we remarked at the time, the valuable and exhaustive character of the debate is the best possible justification for the reading of the paper, and this is a view which Mr. Manville himself shares. The final results of the discussion he very admirably sums up in the following passage, which, as it puts the whole situation concisely, we make no apology for quoting in full:—

> In conclusion I would again state that I think the object of this paper has been amply fulfilled, since the discussion has, on the whole, shown that in the minds of those competent to judge of the merits and demerits of both methods of traction, the conviction exists that each has its own field, and that only in few cases will the conditions be such that it will be difficult to decide which system is the more applicable, and where ill-advised competition should unfortunately arise, the public on the one hand and the shareholders on the other will decide on the survival of the fittest, and I suggest that no amount of academical argument will alter this, the practical issue.

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The Trams Across the Bridges. The Select Committee of the House of Commons appointed to consider the pros and cons of the County Council's project for taking their electric trams across the bridges, and running them along the Embankment, has reported in favour of the scheme. As the last House of Commons was fairly divided on the subject, it may be regarded almost as a foregone conclusion that the present House of Commons will agree with the Select Committee, and that before very long we shall see the passage of a Bill, at any rate through the lower House, for legalising this project on which the County Council has been so determined and on which it has lavished so much energy and expense. We have always been opposed to it for a variety of reasons. We are not one whit the less opposed to the project because some of the great dailies, with the air of bowing to the inevitable, seem to be prepared to alter the attitude they have taken up, and accept the destruction of the Embankment with a resignation usually reserved for a catastrophe of nature. To anyone who has watched the whole agitation from the commencement, the impression produced is that the legislature has been gradually yielding to mere force and pressure. The arguments on the question are exactly what they always were. They have not been altered by an iota. They were held to be powerful against it not very long ago; they are now supposed to have no weight; but neither they nor the circumstances have altered in the slightest.

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A Way Out of a Muddle at Public Expense. The fact of the matter is that the County Council has got its tramways into a nasty mess at the dead ends in front of Westminster and Blackfriars Bridges. Simply to get them out of this mess, and to make their system work somewhat more smoothly, they propose to destroy the Embankment entirely, for a certain period of time while their lines are being constructed, and to deface it permanently by a continuous procession of monstrously ugly two-storied vehicles which will probably be carrying but a modicum of passengers from one bridge to the other. It will not benefit passengers, for few want to be put down on the Embankment. It will simply facilitate the running of the trams, and that not as much as might be supposed, for there will still be the old congestion in the Waterloo Road, at the Borough end of London Bridge, and near Southwark Bridge. For this we are to sacrifice one of the finest river frontages and roadways in Europe, which only the Admiralty Promenade in St. Petersburg, and the Franz-Joseph-Platz in Budapest, equal or surpass. It may be all right to sacrifice every æsthetic consideration to mere material advantages, but where there are no important material advantages to benefit the public, the sacrifice seems gratuitous.

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No Trams for Cricklewood. There is, however, one considerable item of consolation in the findings of the Select Committee. To the proposal of the Middlesex and London County Councils to run a service of trams from the Marble Arch to Cricklewood, they have returned a direct negative.

They will not even discuss the proposal. When the suggestion was first put forward, we pointed out what a scandal it would be if ever it was permitted to take practical shape; that the motor 'bus had made this route peculiarly its own, and had in this way opened up a district which both ordinary 'buses and trams had previously neglected; and that finally, it could only be intended as a direct blow at the motor 'bus industry; while besides the dislocation that would result by the laying down of trams there simply was not room, on long stretches of the route, for trams and motor 'buses to run together. These arguments were certainly quite unanswerable, and it is satisfactory to note that the Select Committee has recognised their weight, and has categorically rejected this very superfluous and unnecessary scheme.

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A London Traffic Board. Every Londoner, and certainly every London automobilist, will wish well to the Bill which has been drawn up by Sir John Dixon-Poynder, with a view of embodying the conclusions arrived at by the Royal Commission on London Traffic, to the reports of which, as they have appeared, we have in the past referred at some length. Broadly speaking, the Bill is designed to create a Board for regulating London traffic on somewhat similar lines (though less autocratically) to those on which the Board of Trade regulates traffic in the country. The Board will not be an executive one, at any rate at present, but is to give its special attention to the continuous study of transport and locomotion in the whole Metropolitan area, and is to advise the Parliament and the Departments of State and local authorities on measures for improvement, such as widening existing streets and roads, and providing for the extension and addition of urban traffic facilities. It is, perhaps, too much to expect, with the large amount of contentious business at present before Parliament, that the Bill is likely to be passed into law at a very early date, but it is something to have the findings of the Royal Commission crystallised into a definite legislative proposal, and it is satisfactory, at any rate, to learn that responsible Parliamentarians are seriously concerned with the formation of a body which should largely prove effective in reducing the traffic chaos which prevails at present in the Metropolis to the very considerable injury of large business interests.

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The Evils of Fine-Supported Rates. On many occasions we have drawn attention to the serious evils that result from allowing the fines inflicted on motorists to go to the relief of local rates. That it is a scandal in country places where, as in Huntingdonshire, a direct diminution in the rates has been traceable to the harvest of fines inflicted on motorists, has been widely recognised. While, however, an evil affects motorists only, there is, alas, comparatively little chance of its being eradicated. It is therefore with a certain feeling of satisfaction that we note, from statistics published in a recent able article on police procedure in the Metropolis which appeared in the *Daily Mail*, that since the objectionable practice was introduced in Metropolitan districts in 1900, and since fines have been there also used to diminish the rates, the amounts exacted from delinquents have increased from £39,806 in the former year to £58,730 in 1905. Can anybody really believe that offences of a finable nature in the Metropolis have increased 47½ per cent. in five years? Is it not much more probable that once fines are recognised as a source of local revenue, both police and magistrates become much more determined on convictions? The article to which we refer was written with special reference to recent unpleasant occurrences in the Metropolis, but we hope the important statistics to which we have alluded will have their effect in hastening forward the day when all police-court fines will go into the Imperial Exchequer, a reform which we have repeatedly advocated, and which, when introduced, will certainly have the effect of making existence much more tolerable for automobilists.

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A New Form of Police Trap.

THE ingenuity with which the police are generally prepared to adapt themselves to circumstances receives striking illustration from a communication which we have received from one of our readers in Alcester. "The local authority" that is supposed to maintain the piece of road between Alcester and Birmingham has been mending a curve of road (where there is a nice broad footpath) with sharp road metal, has taken care to spread the road metal over the whole expanse of the road, and has not as yet provided a steam roller to diminish some of the pointedness of the resistance the new top dressing opposes to traffic in general, and to automobile traffic in particular. Not even a notice board has been erected, so that unfortunate automobilists approaching the newly metalled stretch generally run on to it at moderate speed, and with a big chance of injuring their tyres before they have time to slow down. Naturally under the circumstances they then betake themselves to the unmetalled footpath, when, though they invariably proceed along it at a snail's pace, as soon as they turn the corner they are encountered by a policeman, who ("with an air that is bland") takes their names and addresses with a view of issuing summonses for driving on the footpath. We believe this form of trap to be quite original, and it will be observed that two methods of economy are combined in it. It saves the expense of a steam roller, and provides fines for the alleviation of the rates. There is only one saving element about it, and that is, that the fines which can be inflicted for driving a vehicle on the footpath are very much smaller than can be imposed under the Motor Car Act. Still it is a maxim of our local bodies that every little helps, and the Alcester trap promoters must certainly be awarded the palm for originality of design.

Motorless Man.

THOUGH the authorities in the Isle of Man have not been bad friends to the motor car in the past, the ruling powers at Douglas seem to have set their faces against the motor cab, and an application for licences to run these vehicles for hire in the town was recently refused by the Town Council. Councillor Gill, who was in favour of the application, very naturally observed that the Council were behind the times, and should not refuse a privilege to the public which private individuals enjoy. But the councillors were deaf to such arguments, and objected to the presence of motor cars on the promenade, on account of the obnoxious smell, and owing to the danger to horse traffic (!).

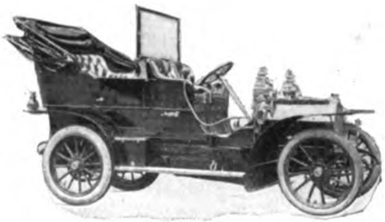
How to Recognise the Cars of To-day.

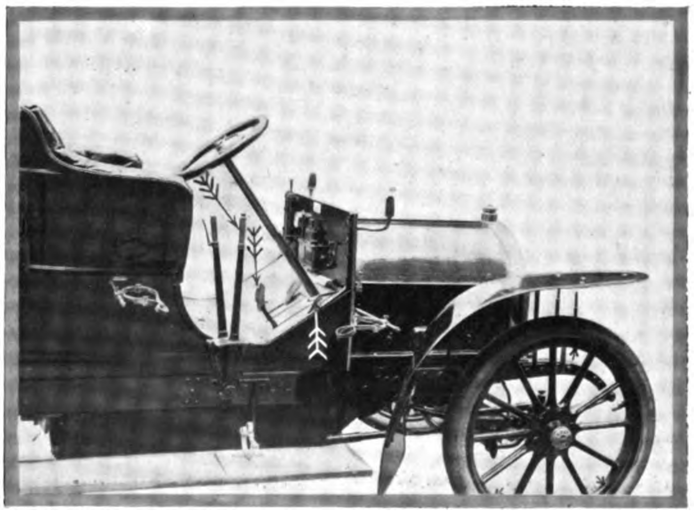
(No. 29.)

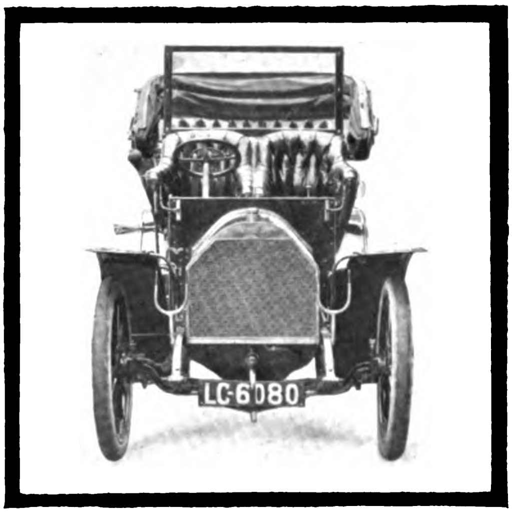
The Berliet

(FRENCH)

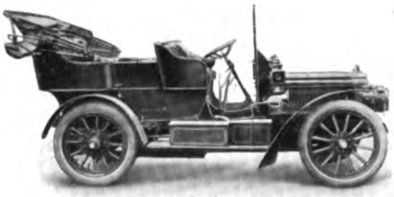
22, 40 & 60 H.P.







These cars are called the French Mercédès and closely resemble their German prototype; they may be distinguished, however, by the vertical arrangement of the side levers and by the inside position of the brake lever. Another characteristic is the peculiar shape of the pedals.

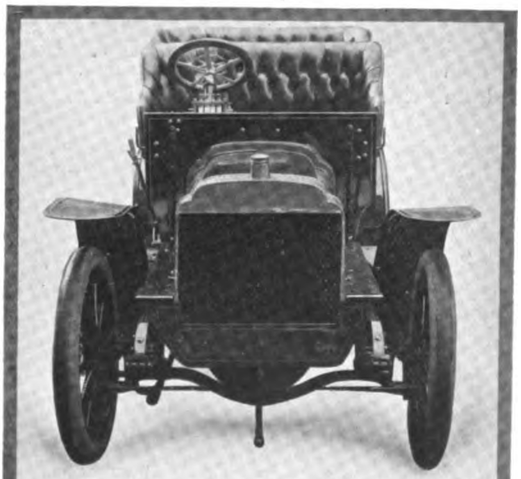


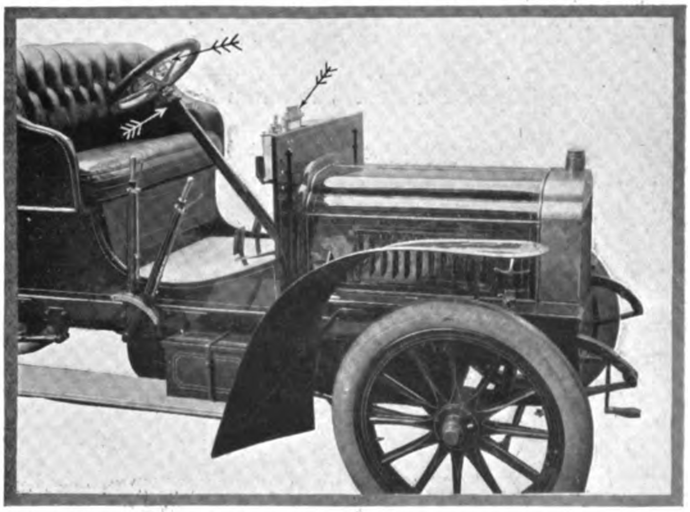
(No. 30.)

The Swift

(BRITISH)

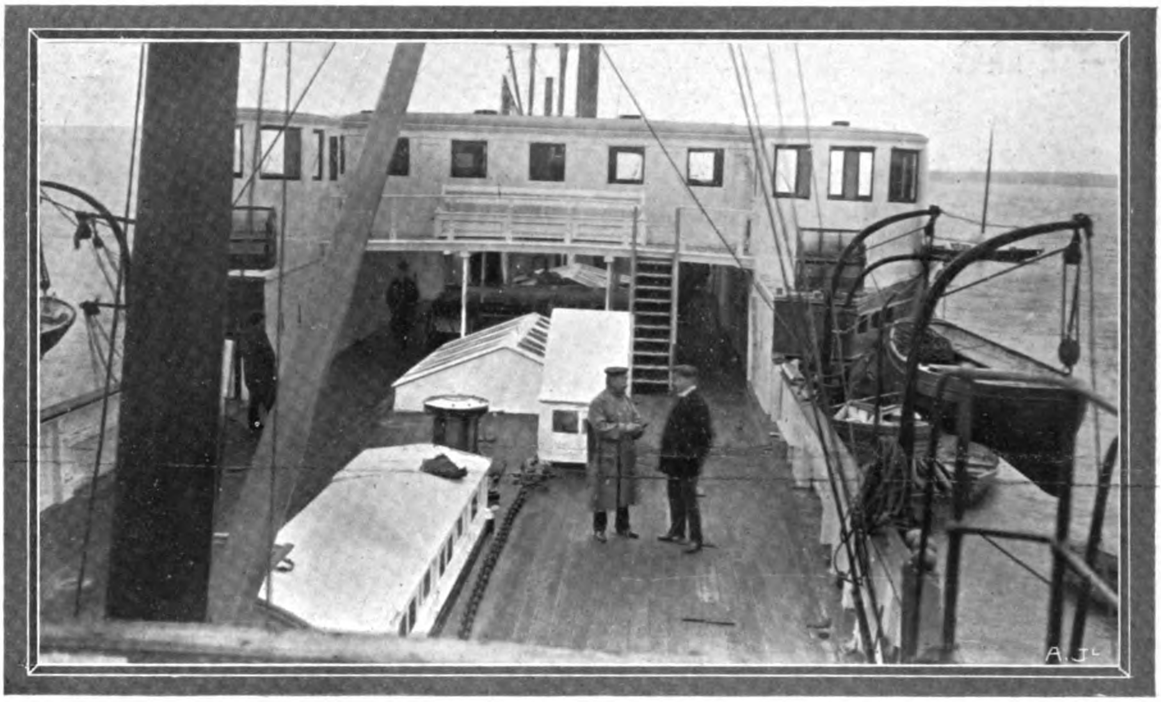
7, 9, 12 & 16 H.P.





Swift cars are distinguishable by the TUBULAR RADIATOR surmounted by its LARGE WATER TANK, and by the general shape of the bonnet. Other unusual features, however, are the circular control-lever quadrant above the wheel, and the fitting of a BALL-BEARING HEAD ON THE STEERING COLUMN.

THE FLOATING CLUB HOUSE OF THE MOTOR YACHT CLUB.



MOTOR YACHT CLUB.—The "Enchantress." View from the promenade deck, looking forward.

IT has for long been known that the Motor Yacht Club were in possession of a very fine vessel, the "Enchantress," which was being rigged out for the use of their members as a regular floating club-house on Southampton Water, with a special view to the yachting events in the summer that take place in the immediate neighbourhood. The "Enchantress" was originally purchased by the rear-commodore of the Motor Yacht Club, Lieut. Mansfield Cumming, and has now been fitted up for the purpose above described, and commissioned by the club. Without the generous help and work of the rear-commodore, however, this would not have been accomplished for many a day yet. Friday in last week was a gala day for the club, as the floating club-house, with its very appropriate name, was that day officially inaugurated. The committee of the club and a number of members and guests journeyed to Southampton to inspect the new acquisition. The roomy vessel, which was formerly practically the private yacht of the Lords of the Admiralty, is moored off Netley Hard, close to the hospital, and a very merry company were brought on board her by the club motor launch, a 24-h.p. Thornycroft cabin launch, and "Napier IV," which were in attendance for the purpose, at Southampton Pier, when the visitors arrived. The inspection of the vessel proved something of a surprise to the visitors. To begin with, the engines and boilers had been completely removed, leaving space for a fine banqueting hall or ball-room, some 90 feet in length, which, tastefully bedecked with flags, served as the luncheon room for the day. Throughout the yacht has been fitted out with discretion and the most excellent

IN SOUTHAMPTON WATER.—"Hutton II," with Mr. J. E. Hutton in charge, visited by Mr. S. F. Edge and a party on board "Napier IV."

MOTOR YACHT CLUB.—The indefatigable Rear-Commodore, Commander Mansfield-Cumming, R.N., whose interest in the Club has helped so much to its present success.

taste, including numerous state cabins, many of which are exactly like small luxurious bed-rooms.

Both paddles have been removed, the space thus available having been well utilised. One has been fitted up in a very original way as a kind of inverted "pit" for motor boats, which can be hauled up, inspected and examined, and tinkered at from below. The other paddle box contains two bathrooms and a photographic dark-room for the use of members. A feature of the baths is that everybody taking a bath has to pump up his own water, which provides exercise as well as refreshment. As the presence of ladies on board is, at any rate, occasionally contemplated, there is a drawing room, whilst a daintily-appointed ladies' dressing room and boudoir has been fitted up. Mere man is catered for very effectively by charming smoke, card, and reading rooms, accommodated in a pent-house situated on the top of one of the old deck-houses, which has been turned round at a right angle on the deck and ingeniously fitted up for the purpose. A smaller deck-house is arranged over each of the empty paddle-boxes for the use of judges and observers when races or trials are being held.

MOTOR YACHT CLUB.—On board the "Enchantress." Sir Boverton Redwood, the Vice-Commodore of the Club, on the right; Mr. F. P. Armstrong, a member of the Committee, on the left; and Mr. Julian W. Orde, the Secretary of the A.C.G.B.I., in the centre.

Secretary W. Morris on board the "Enchantress."

A souvenir of its past history remains on the "Enchantress." Formerly, as already mentioned, she was to all intents and purposes the private yacht of the Lords of the Admiralty, and the First Lord's state-room is still retained as it was when used for his accommodation, the decorations being practically unaltered. There is a splendid promenade deck, and the convenience of the members is catered for by a club launch which travels at stated times between the Club houseboat and Southampton Town Quay to meet trains, at other times being "at call" for near shore or other work.

Mr. Frank H. Butler, the well-known all-round motoring sportsman, the first member of the Motor Yacht Club who secured a state-room on board the "Enchantress."

For those members of the Motor Yacht Club who are also motorists—and there are a good many of them—part of the boathouse at Netley Hard is arranged as a garage, and a limited number of cars can be accommodated there for those who arrive by road. There is also a club sailing boat for the use of members.

Naturally, a considerable number of the members will

Mr. Linton Hope.

MOTOR YACHT CLUB.—On board the "Enchantress." Mr. S. F. Edge appreciates a point.

engage in motor boating during the coming season, and for their benefit the fo'c'sle is being fitted up as a workshop and repair room.

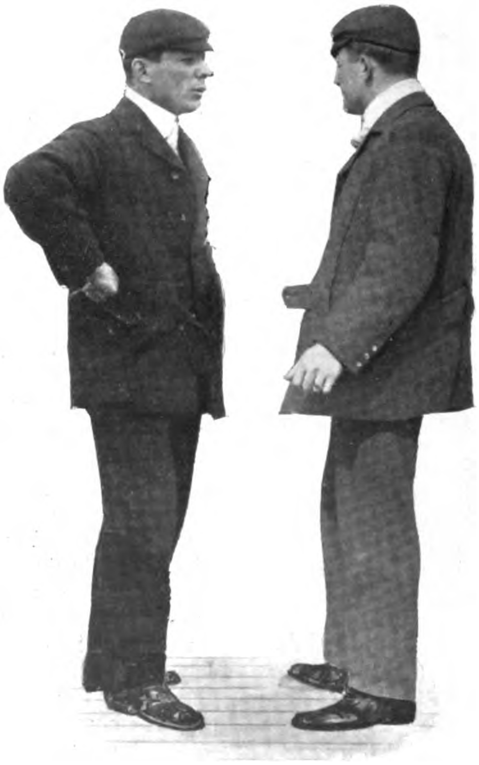
Mr. F. R. S. Bircham enjoys the freedom of the floating club house of the Motor Yacht Club.

The enormous convenience of possessing such a headquarters right in the middle of Southampton Water should appeal to all owners of motor boats or indeed any other craft, and when we consider the large number of motor boat fixtures which the club has already organised for the coming season, without considering the other motor boating events, it may be confidently anticipated that the membership of the club, considering its very moderate subscription fees, will increase very considerably during the present year.

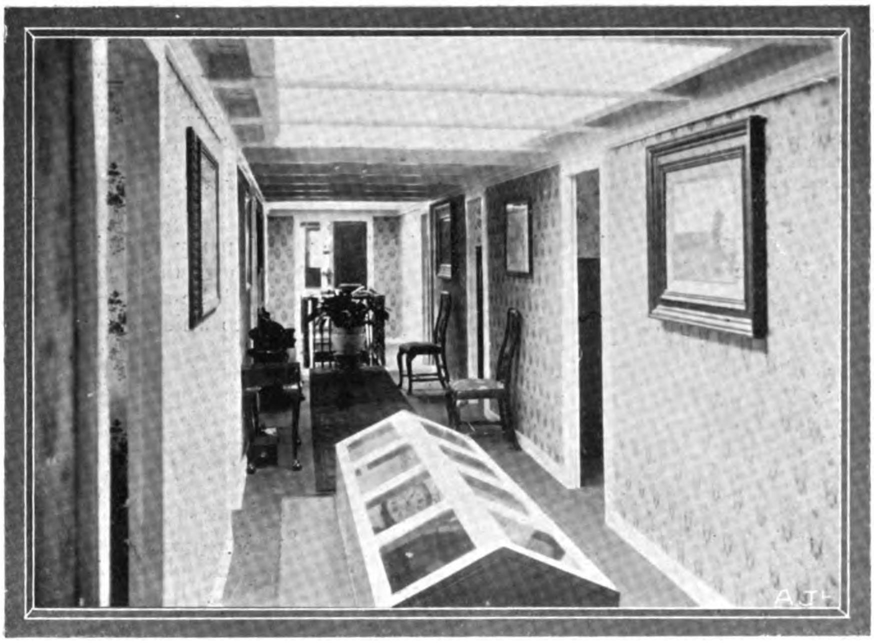
Mr. J. E. Hutton comes on board the "Enchantress" from his racer, "Hutton II."

At the inaugural lunch, which was served in the old engine room, decorated with flags out of all recognition, the proceedings—apart from demolishing the excellent fare provided for the keen appetites which had been fostered by the bracing air of Southampton Water—were of the very shortest possible duration.

The Vice Commodore, Sir Boverton Redwood, without formality, proposed "Success to the Good Ship 'Enchantress,'" he very emphatically disowning any part in the remarkable work which has been accomplished in so short a time. The acquisition, fitting out, and commissioning was due entirely to their Rear Commodore, loyally backed up by the club committee. He said much, however, had yet to be done to complete the success of the project upon which they were embarked. A large membership was essential before they could hope to be in smooth water, metaphorically speaking. The scope of the club reached considerably beyond owners of motor boats. They sought to establish better relations with yachting men, who possibly in several instances were somewhat prejudiced against the motor boat. The best way to overcome this prejudice was to hold out inducements to members to join, whether they owned motor boats or not, and he felt sure in the end that this would lead the yachtsmen to come to understand them better. Sir Boverton announced that Mr. Lorne Currie had promised



Mr. Bernard B. Redwood recognises a lifelong friend on board the "Enchantress."



MOTOR YACHT CLUB.—The "Enchantress." The corridor and entrance to the state-rooms, under the aft main deck.

a fifty guinea cup for their racing season, and Mr. Bircham, he was glad to say, had also promised a cup. The floating club-house would afford an ideal opportunity for members to witness races for these cups, and the many other items which formed the programme of the Motor Yacht Club. He felt convinced that as the advantages of the club-house became known, Mr. Frank Butler's example of securing a berth on her would be largely followed, and applications would be so numerous as to render it difficult for them to afford the sought-for accommodation.

Subsequently the toast was given by Mr. S. F. Edge of "The Vice-Commodore and the Rear-Commodore," in conjunction with the amateur "Waiters," who consisted of members of the committee and others who insisted upon looking after the welfare of their guests of the day.

Sir Boverton Redwood, as the vice-commodore, again repudiated any credit for the remarkable way in which the old Admiralty yacht had been turned into the charming floating club-house that they had seen that day.

Commander Mansfield - Cumming, in giving voice to his thanks for the compliment paid him, ventured to remark that he *thought* that he was a doubtfully good ship furnisher, but he *knew* he was a considerably worse speaker, and would not, therefore, give proof of his weakness in the latter respect.

Instead of prosaically returning in the evening to London by the London and South Western Railway, we availed ourselves of the invitation of Mr. S. F. Edge to test once again the running qualities of his 6-cylinder Napier. Except for the but too usual tyre mishap, which in this case came to us at Winchester, travelling to town through the bracing air, in 6-cylinder form, was a delightful experience, and more easy and luxurious than in the most perfectly-constructed Pullman. Fortunately, on the Hog's Back the trappers had ceased to ply their calling, so that in the still night air we were able to take note of the behaviour of the 6-cylinder over a bit of straight. A curious feature in this journey was that since we last drove over the route all the hills seemed to have disappeared —at least, on this occasion we failed to notice any.

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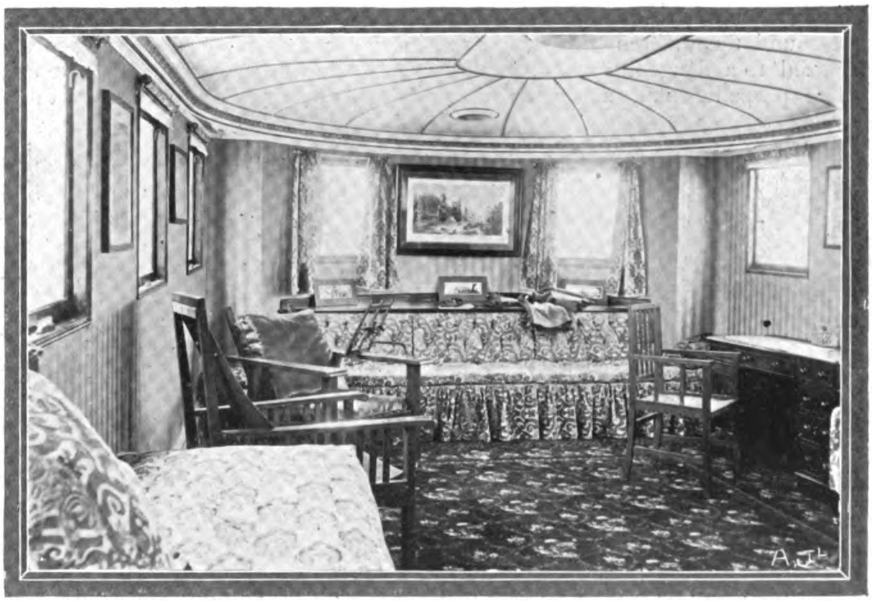
A Simple Explanation.

The man who used to get into a paroxysm because his motor would not start, and subsequently found that he had forgotten to turn the petrol tap on, is now probably extinct, but he has found a successor (or has come up in a new form) in the shape of an amateur who had recently become the owner of a Clement-Talbot car. He was complaining to Mr. C. R. Garrard of the monstrous behaviour of his car, which refused to start, it was presumed, because one of the pair of batteries was out of order. He threw over the switch to the other battery and still no movement of the motor followed his effort. "There" he exclaimed, "the whole (epithet) thing is rotten." But when the trouble was more deeply probed it was found that someone had abstracted the other set of accumulators, and that the place in which they should have reposed was empty!



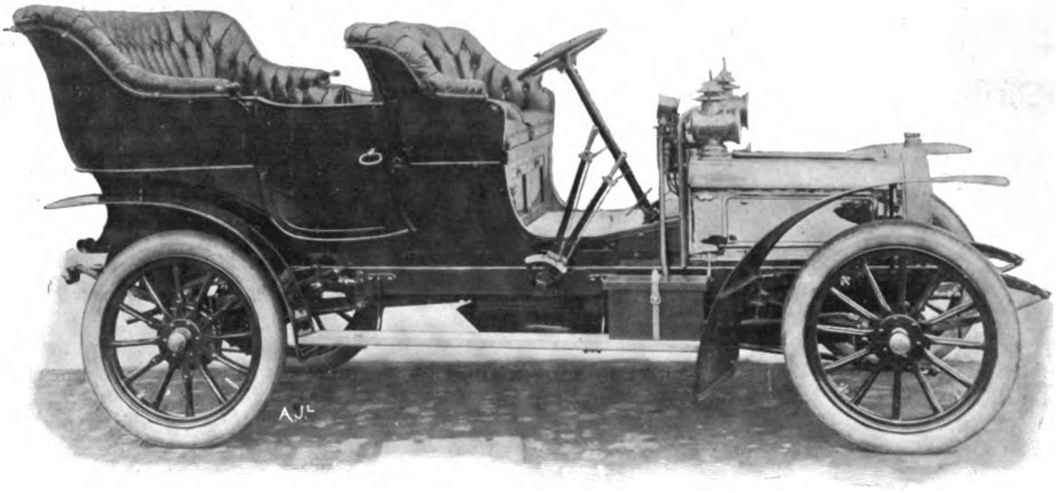
MOTOR YACHT CLUB.—A corner of the smoke and reading room on the "Enchantress."

THE CLEMENT-TALBOT PETROL CARS.—PART II.

In the previous portion of this article, the general characteristics of this well-known make of vehicle were dealt with, and brief particulars were given of the various models now on the market. It was then pointed out that all the various sized cars bear a very strong family likeness to one another, although the very smallest have twin-cylinder engines with live-axle transmission, and the most powerful standard types are driven by side-chains. Special reference was made to the latest model, which is now being built complete in the British Company's works—a very useful and thoroughly up-to-date model of which we now proceed to give a detailed description, with illustrations showing all the more important parts.

The 20-24-h.p. Car.

A COMPARISON of Figs. 9 and 10 with Figs. 2 and 3 will not only show the close resemblance that there is at first sight between the 20–24-h.p. and the earlier 12-16-h.p. chassis, but will also enable the many minor but important differences to be recognised on closer inspection. The main frame, with its underframe, are almost precisely similar, the engine and the gear-box being carried in the same way, and the propeller-shaft being enclosed in the tube, D^8. The arrangement of this tube, however, is in reality very different, for previously it was clipped between the two halves of the casing that surround the differential-gear, whereas in this case it is brazed to a flange-fitting, D^7, which is bolted in place. The propeller-shaft, moreover, runs in ball bearings instead of in plain sleeves, and many very interesting changes have been made throughout the design of the live-axle. These various points will be rendered clear in the sectional drawing (Fig. 13) to which we shall refer presently, after we have devoted a few words to the front axle and to the steering-gear.



The 12–16-h.p. Clement-Talbot touring car, fitted with the standard side-entrance Body.

It will, of course, be recognised that in Figs. 9 and 10—which are views from above and from beneath respectively—the chassis from which these photographs were taken was not quite completed at the time. Thus, for instance, the hub-brakes, the ratchet-sprag, and the steering-gear, are not coupled up by their intermediate connecting-rods. This is, however, immaterial, since in each of these cases it needs but a glance at Figs. 2 and 3 to ascertain the nature of these missing portions.

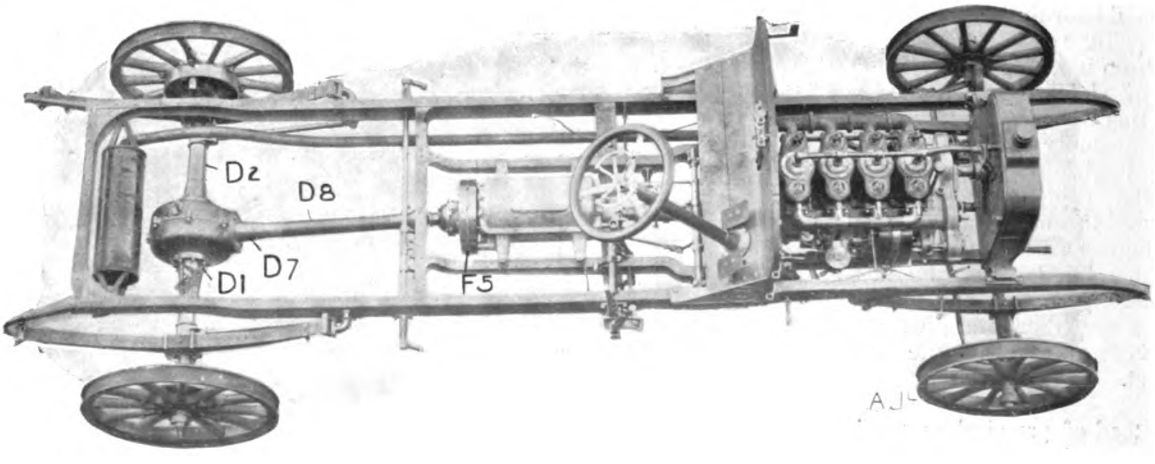


Fig. 9.—The 20-24-h.p., all-British, Clement-Talbot Chassis. View from above, showing the general arrangement of the entire mechanism; the chassis was not quite completed at the time that our photographs were taken, part of the steering-gear and some of the brake-operating rods being absent.

The Front Axle.

One end of the front axle, showing the hub of the off-side wheel in section, is shown in Fig. 11, and here the shape of the forging, which forms the axle and the steering-heads, is rendered quite evident. The wheel itself is carried by two ball-bearings, which are so designed as to take all end thrusts, as well as to support the weight of the vehicle. These bearings are rendered adjustable, and there is ample room inside the hub to retain sufficient lubricant to last for a considerable period. The steering-heads themselves have plain bearings, and it will be noticed that the rod which connects the two heads together lies behind the axle.

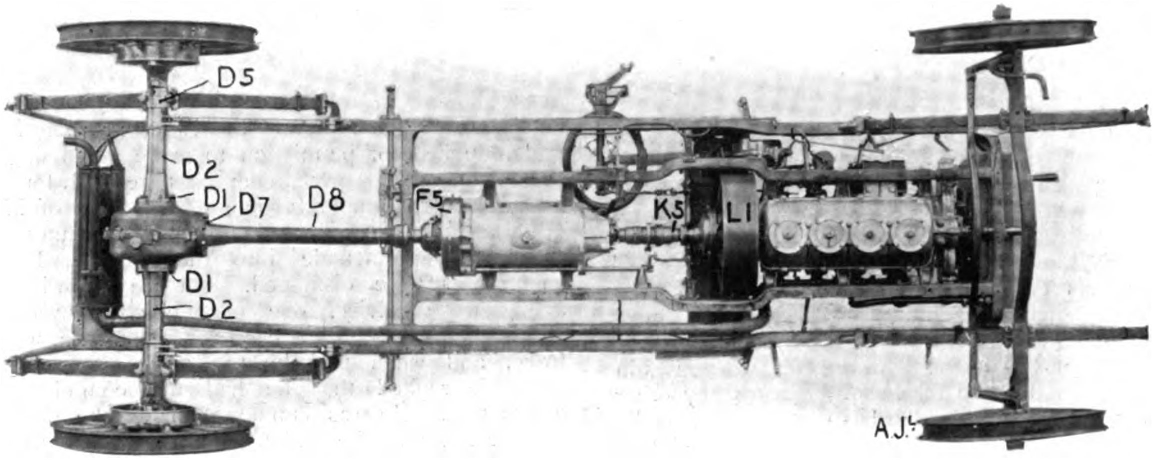


Fig. 10.—The 20-24-h.p. Clement-Talbot Chassis. View from beneath showing the Engine, the Clutch, the Change-speed-gear, and the special arrangement of the Rear Axle.

The Steering Gear.

In Fig. 12, the steering gear, with its pillar, its wheel, and the engine-controlling levers above the wheel, are shown sectionally. The gear itself is of the worm-and-nut type, the nut, C, being unusually long to prevent wear, and being bushed internally with white metal. It engages with the pivoted steering-arm, C^1, by means of small slotted trunnions on each side, and the casing containing it is formed by two castings. Fixed securely to the worm, and connecting it with the wheel, is the large steel tube that lies just inside the stationary containing tube, and just above the steering-gear proper is the adjustment nut, C^2, for taking up all end-play of the worm. This is the only adjustment needed for preventing back-lash after prolonged use, and is always easily accessible.

It will be noticed that there are apparently an abnormal number of concentric tubes inside the steering pillar, but each of these has its own functions to perform, and all are needed. The external stationary casing renders the steering-pillar thoroughly rigid, and affords a steadying bearing just beneath the wheel. The first tube, inside it, is that which connects the wheel with the worm, and

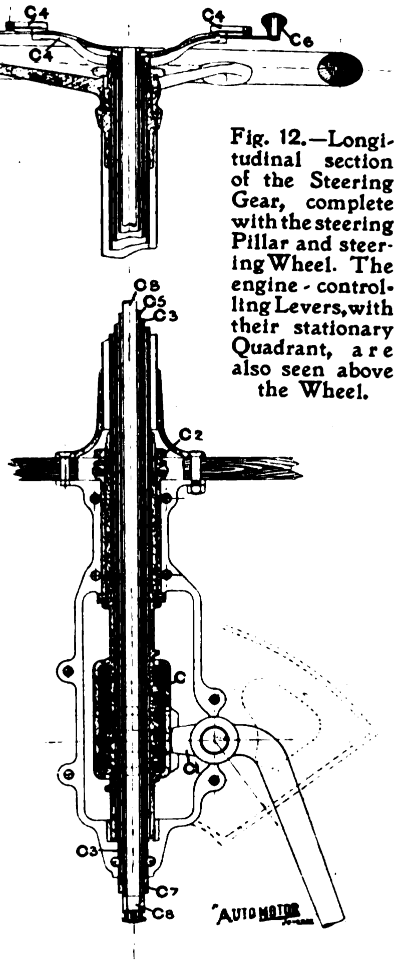


Fig. 12.—Longitudinal section of the Steering Gear, complete with the steering Pillar and steering Wheel. The engine-controlling Levers, with their stationary Quadrant, are also seen above the Wheel.

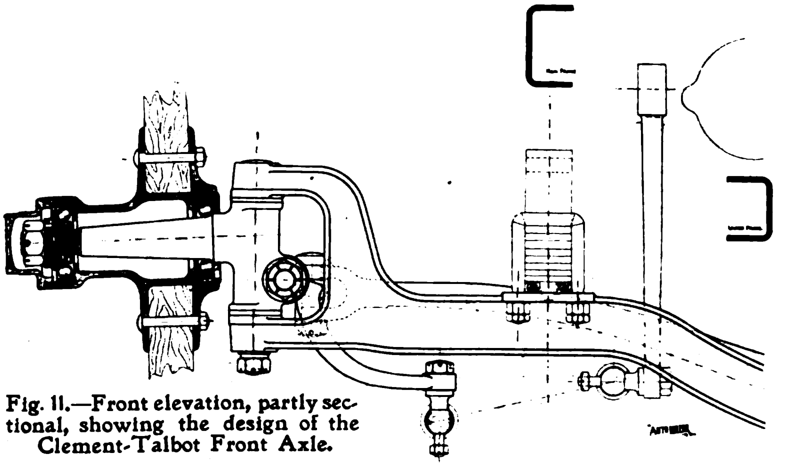


Fig. 11.—Front elevation, partly sectional, showing the design of the Clement-Talbot Front Axle.

then comes another stationary tube, C^3, that prevents the quadrants, C^4, from turning with the wheel. This tube is, it will be noticed, clipped to the base of the steering-gear casing, and inside it are the tube, C^5, and the rod, C^8, which are respectively secured to the hand-levers, C^6 and C^9. These hand-levers, as usual, control the throttle and the ignition, the tube, C^5, carrying the lever arm, C^7, at its lower end, and the rod, C^8, being fixed to another similar lever.

(*To be continued.*)

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An Object Lesson in Prosperity.

FROM the days when Lady Godiva adopted an original method of reducing local taxation, the city of "the Three Tall Spires" has always been progressive. Formerly it was the metropolis of the cycle industry. Then it was identified with the pneumatic tyre, and now it is literally the place where "the motors come from." The result is that it has become one of the most prosperous (perhaps everything considered the most prosperous) manufacturing town in the United Kingdom, and a proof of this is found in the fact that houses in Coventry cannot be had for love, money, or any other consideration to which landlords are usually amenable. To such an extent has the house famine reached that an immense number of employees who are occupied in the production of automobiles have to live in the neighbouring towns. A few figures will give an idea of the congestion prevalent.

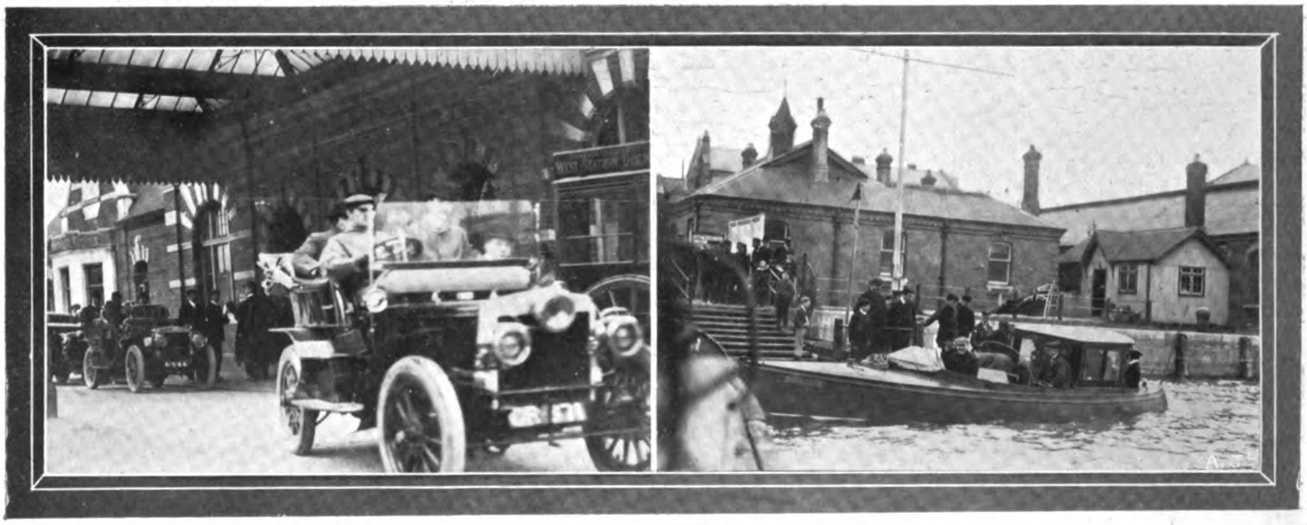
The Ordnance Works a year ago employed 1,000 men. Now they employ 3,000. In the same period the employees of the Daimler Motor Works have risen from 800 to 1,450. The existence of such a situation in a town principally devoted to automobile production should be recommended to the attention of the reactionaries who in Parliament, and out of it, think they can put back the hands of the clock of progress, and are disposed to deny that the future of the United Kingdom and the future of the automobile movement are for all practical purposes one and the same thing.

Blackpool Anti-Automobilism.

THE Blackpool Corporation seem to think that there is no necessity for motor business people to have access to their premises. Motors (Limited), which has been allowed to establish a garage and works, the entrance to which is across the Central Beach Promenade, applied for permission to make a crossing over the latter. This permission was refused for some remarkable reason, and some of the staff of Motors (Limited), were summoned for pushing automobiles across the promenade into the garage. But the summonses were dismissed. On the following day, acting upon advice, one of the company's representatives drove a motor car over the same footpath twice, and when told by the police he would be reported, replied that he had not committed any obstruction. He was summoned before the Blackpool magistrates, and the Chief Constable stated that the prosecution was instituted under the Blackpool Act of 1893, under which obstruction need not be proved. It was very naturally contended, however, by Mr. Rowland Robinson, who appeared for the defence, that under the common law of England the possession of premises implied access. The magistrates, after retiring for a long time, dismissed the summons, and stated that it was a great hardship that the application had not been dealt with by the Corporation. Two other cases of the same kind were accordingly withdrawn.

King Alfonso's Next Car.

COUNT BOPP VON OBERSTADT, the president of the Bavarian Automobile Club, has received a communication from King Alfonso, stating that he intends placing an order for a car capable of a speed of eighty miles an hour, not because His Majesty intends racing at that speed, but that owing to the stiff gradients, and terrible surface of the Spanish roads, a particularly powerful car is needed.



The Inauguration last week of the floating Club House. Visitors driving from Southampton West Station by motor car.

"Napier IV," one of the motor launches which carried the visitors down to the "Enchantress," just starting.

THE MOTOR YACHT CLUB.

THE AUSTIN PETROL CARS.—PART III.

(*Continued from page 572.*)

So far as the radius-rods, A, and the springs with their shackles are concerned, the same parts are used whether the "drive" is by side-chains or by propeller-shaft, but in the latter case a central torque-rod, A^3, is fitted as well. All these parts are shown in Fig. 9, which is a side elevation of a portion of the live-axle chassis. Here it will be seen that the springs, which are 4 ft. in length, are of a curious shape, for they are curved downward slightly towards their ends instead of being of the usual semi-elliptic form; an improved action is said to be obtained in consequence. They have shackles at both ends and are fixed by two large ∩-bolts to the brackets on the axle. Even more striking is the design of the radius-rods, A, which not only have universal-joints (double-knuckles) at each end but are also swivelled (at A^2) so as to ensure absolutely free play for the springs. They tie the rear axle to the side members of the frame, being attached to the spring-brackets at one end and to the same brackets as the spring-shackles at the other end. On the chain-driven cars, these brackets on the frame also receive the ends of the casing that encloses the differential countershaft.

The torque-rod, A^3, is so forked that it can be attached to the top and the bottom of the central axle-casing, and at its front end it is secured by a ball-and-socket joint having cushion-springs to a pivot-pin, A^4, on the main-frame. There is a considerable difference between the length of the torque-rod, A^3, and that of the propeller shaft, F, the former being kept short in order to balance up the angularity of the two universal-joints on the propeller-shaft.

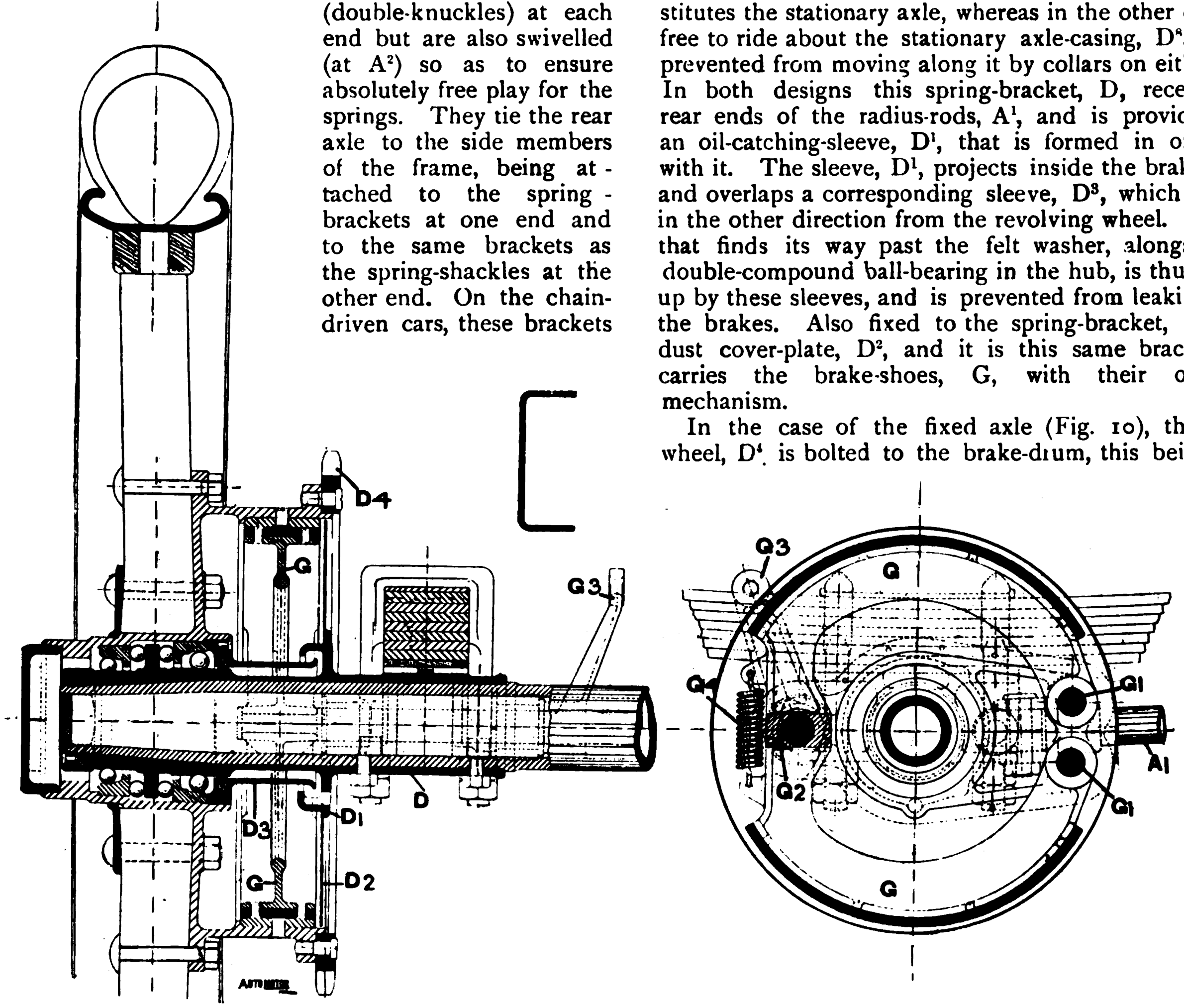


Fig. 10—Longitudinal section and end elevation of the rear axle on the chain-driven "Austin" Chassis, and of the hub-brakes which are common to both models.

The Rear Axle.

Fig. 10 shows the construction of the axle for the chain-driven car, and Figs. 9 and 11 refer to the live-axle model. In both cases the hub-brakes, the radius-rods, the springs, and the ball-bearings for the road-wheels are identical, and the only differences that exist in the fitting of these parts are those due to the altered nature of the axle, and of the means whereby the power is transmitted to the road-wheels. The spring-bracket, D, is in the former case fixed to the solid-drawn steel tube that constitutes the stationary axle, whereas in the other case it is free to ride about the stationary axle-casing, D^6, and is prevented from moving along it by collars on either side. In both designs this spring-bracket, D, receives the rear ends of the radius-rods, A^1, and is provided with an oil-catching-sleeve, D^1, that is formed in one piece with it. The sleeve, D^1, projects inside the brake-drum, and overlaps a corresponding sleeve, D^3, which projects in the other direction from the revolving wheel. Any oil that finds its way past the felt washer, alongside the double-compound ball-bearing in the hub, is thus caught up by these sleeves, and is prevented from leaking upon the brakes. Also fixed to the spring-bracket, D, is a dust cover-plate, D^2, and it is this same bracket that carries the brake-shoes, G, with their operating mechanism.

In the case of the fixed axle (Fig. 10), the chain wheel, D^4. is bolted to the brake-drum, this being solid with the main portion of the hub. The live-axle design (Fig. 11), however, is such that the road wheel is driven by a jaw-clutch member, D^5, which is keyed and bolted upon the tapered end of the "live" shaft, D^6. A special feature of the live-axle is its great strength, for not only are the solid-drawn axle-tubes, D^6, given a tapering cross-section, but the entire stationary portion is stayed on the under side by the tie-rod, D^9, which engages with the central casing and is hinged at each end to the rigidly-fixed collars, D^7. By this construction, the pull of the tie-rod, D^9, is transmitted direct to the centres of the road wheels, and does not therefore tend to distort the axle-casing.

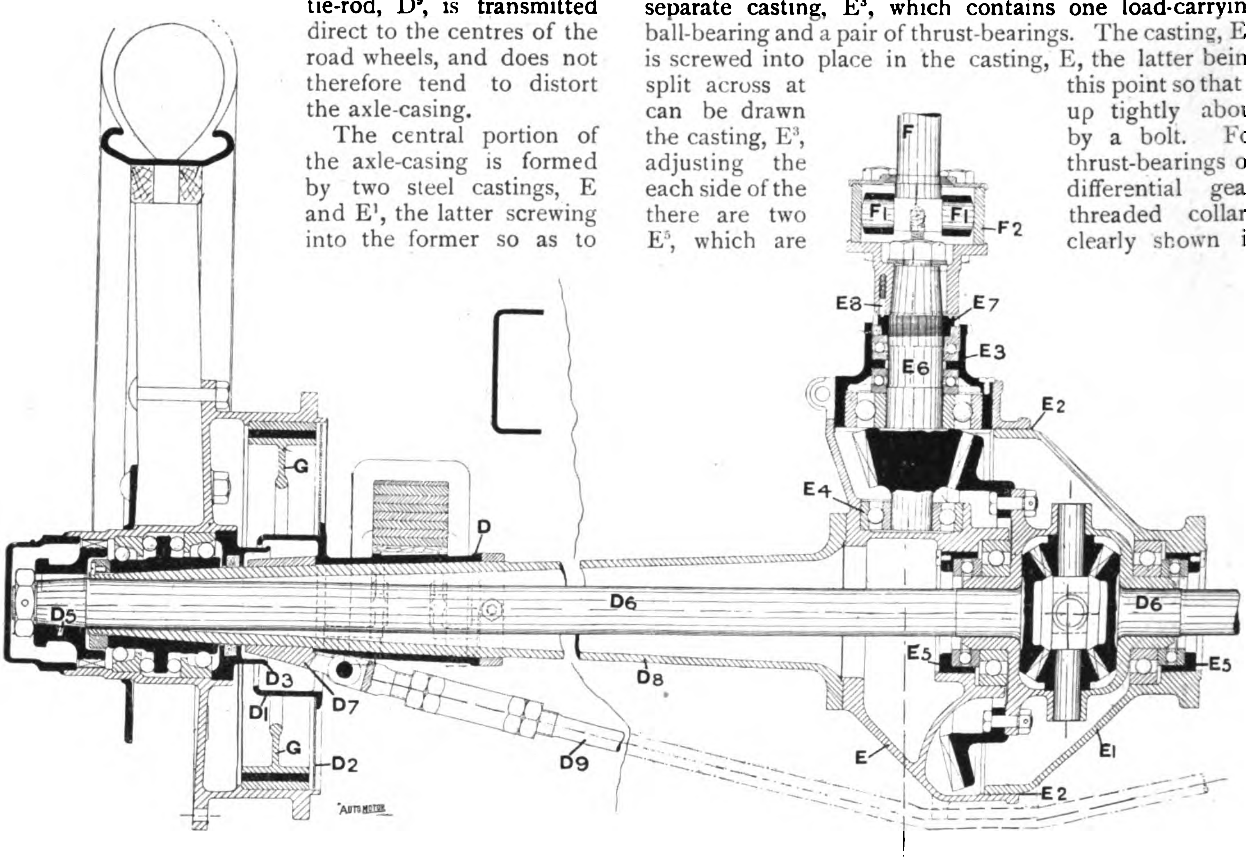


Fig. 11.—Longitudinal section (partly vertical and partly horizontal) of the "Austin" live rear-axle.

The central portion of the axle-casing is formed by two steel castings, E and E^1, the latter screwing into the former so as to make a large circular joint at E^2. To it, the axle-tubes, D^8, are fixed, by studs that pass through the flanges, and inside it, the differential-gear is carried between two sets of ball-bearings. The differential-gear lies quite centrally between the road wheels, but it will be noticed that the propeller-shaft is placed 5 ins. to the left of the centre-line of the chassis. Also enclosed inside the casing is a ball-bearing, E^4, which supports the extreme end of the short shaft, E^6, that carries the bevel-pinion. This shaft is mainly mounted inside a separate casting, E^3, which contains one load-carrying ball-bearing and a pair of thrust-bearings. The casting, E^3, is screwed into place in the casting, E, the latter being split across at this point so that it can be drawn up tightly about the casting, E^3, by a bolt. For adjusting the thrust-bearings on each side of the differential gear, there are two threaded collars, E^5, which are clearly shown in Fig. 11, and for preventing any play from taking place between the two thrust bearings on the shaft, E^6, there is a collar, E^7, threaded upon that shaft.

The collars, E^5, are locked by cheese-headed screws after they have been tightened up to the desired extent, and the collar, E^7 (which is fitted with an oil-retaining felt washer), is locked by the spring catch, E^8.

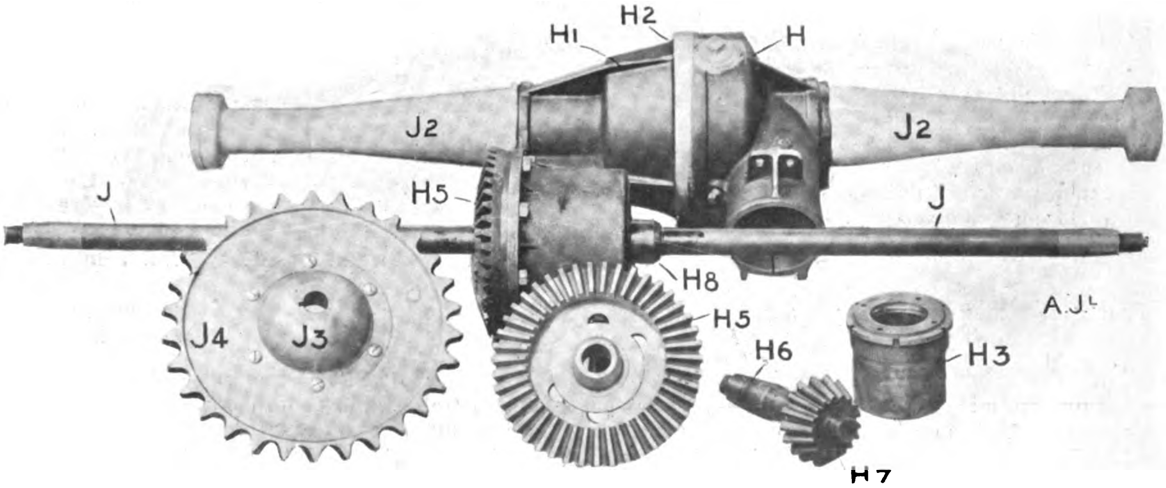


Fig. 12.—View of the "Austin" differential countershaft, showing the chief portions of the mechanism lying alongside the containing casing.

The shafts, D^6, are made in one piece with their bevel-wheels, and they, therefore, cannot be withdrawn sideways as in some makes of car. It will also be noticed that the differential-gear is of the bevel type with four planets, and that the large bevel-wheel—by which it is driven—is bolted, with a registering flange, to the shell.

At both ends of the propeller-shaft, F, the universal-joints are of the cardan type, but have four pins, F^1, instead of the more usual pair of pins. All four pins carry driving blocks, and there are consequently four slots inside the outer member, F^2. In Fig. 11, it will also be noticed that this universal-joint is rendered oil-tight without the use of any external leather casing, and that the shaft is prevented by a spring from moving freely endways. The corresponding joint at the front end of the shaft is of similar construction, but it is somewhat modified in order to allow for the necessary telescopic action. Very little angularity is required in either universal joint, owing partly to the unusual length of the shaft.

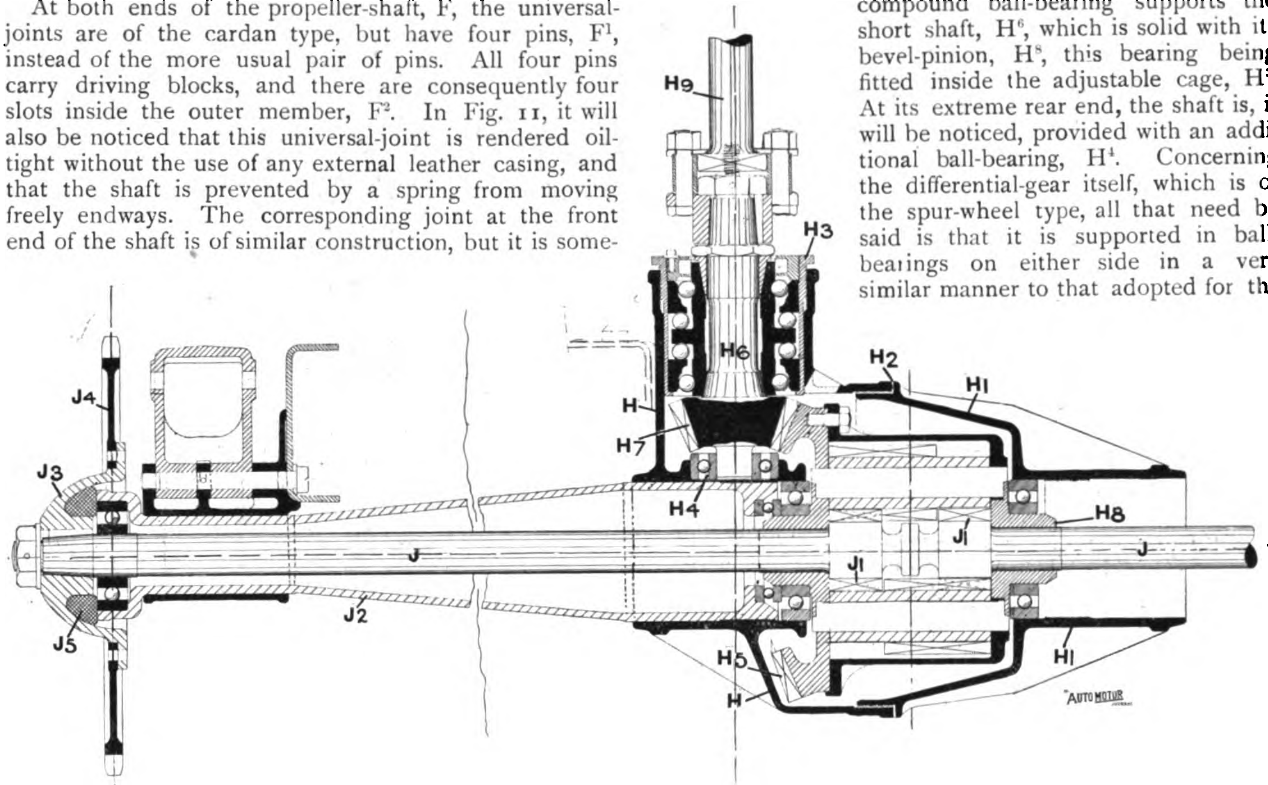


Fig. 13.—Longitudinal section (partly vertical and partly horizontal) of the differential countershaft employed on the "Austin" chain-driven Chassis.

The Hub Brakes.

Referring to Fig. 10, in which the hub brakes are shown most clearly, it will be seen that the brake-shoes, G, are pivoted upon two pins, G^1, and that they are normally drawn together by the spring, G^4. For forcing them apart, the cam, G^2, is mounted upon the same rock-shaft as the operating-lever, G^3, and this shaft is well supported in liberal bearings. In Fig. 2 is seen the steel cable and the rocking cross-tube, by which the two brakes are simultaneously operated. The cable passes through the tube over small pulleys, and thus serves to equalise the pull upon the two sets of brake-shoes.

The Differential Countershaft.

Fig. 13 is a sectional drawing of the differential countershaft, and not only corresponds with Fig. 11, but also indicates the similarity that there is in design between this mechanism and the live-axle. Thus, the central portion of the casing is formed by the two castings, H and H^1 (jointed at H^2), and the two live-shafts, J, are enclosed in tapering portions, J^2. In this case, however, the portions, J^2, are steel castings, and they screw into place instead of being flanged and bolted. Another difference is that the ends of the shafts, J, each have a single-row ball-bearing, and that this bearing lies inside the casting, J^2.

Several of the more important portions of the countershaft are shown in the photograph reproduced in Fig. 12, but their arrangement in relationship to one another is best indicated in Fig. 13. A double-compound ball-bearing supports the short shaft, H^6, which is solid with its bevel-pinion, H^8, this bearing being fitted inside the adjustable cage, H^3. At its extreme rear end, the shaft is, it will be noticed, provided with an additional ball-bearing, H^4. Concerning the differential-gear itself, which is of the spur-wheel type, all that need be said is that it is supported in ball-bearings on either side in a very similar manner to that adopted for the live-axle. The shell has the bevel-wheel, H^5, bolted at one side, and the boss, H^8, screwed into place at the other.

As in the case of the live-axle, so in this design, the shafts, J, are solid with the pinions, J^1, and special provision is made around the outer ends of these shafts to retain the oil in the bearings. For this purpose, the large felt-washers, J^5, are introduced inside the hubs of the sprockets. Another noticeable feature is that the sprockets, J^4, encircle the ball-bearing instead of overhanging it, and thus cause the pull of the chain to be taken squarely by the shaft. The sprockets, J^4, can, moreover, be easily changed, since they are made in a separate piece from the hub-portion, J^3. In Fig. 13, the shape of the brackets by which the countershaft-casing is secured to the side-members of the chassis is clearly shown, as also the shackles that receive the front ends of the rear springs. Similarly in Fig. 12, the lugs that project from the casting, H, for attachment to the main frame, are visible.

Between the short shaft, H^6, and the change-speed gear-box, is the connecting-shaft, H^9, this having flexible couplings at each end, in order to prevent any strains from being imposed upon either shaft. The couplings are of that type in which the squared ends of the connecting-shaft fit into corresponding cups on the other shafts, the squared portions being rounded off on the edges so as to give a partial universal action.

(*To be continued.*)

HEADLIGHTS.

Ever since motorists began to adorn their cars with those powerful lamps which alone make night-driving even feasible, we have constantly had occasion to call attention to the dangers of their indiscriminate use, and have as often urged the desirability of some simple device for enabling the dazzling effect of the light to be regulated at will. Lately one or two such devices have come upon the market, and there is evidence that much careful consideration is being given to the question. One of the most simple solutions has been to fit a by-pass cock in the gas-pipe, which can be operated by a Bowden wire from the driver's seat. This has, of course, the merit of adaptability, for it can be fitted to almost any make of lamp, but, on the other hand, an unfortunate tendency for the burner to become choked by carbonisation has, we understand, been found with this arrangement. Some of the more recent devices which have been introduced, however, have been of a different character to this, and have aimed rather at neutralising the effect of the reflector than at reducing the total quantity of the light in the flame.

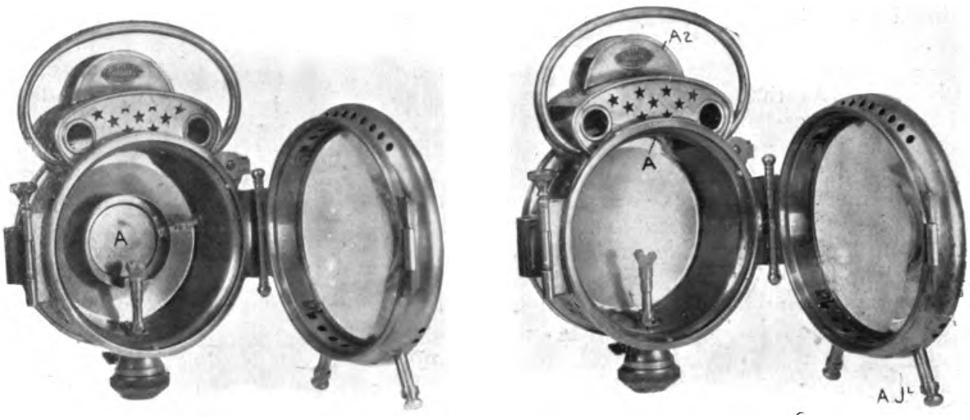


Fig. 2.—The Autoclipse Lamp. Views showing the shield, A, in and out of action. Its purpose is to intercept the rays from the mirror, and when not in use it is retained in the dome, A².

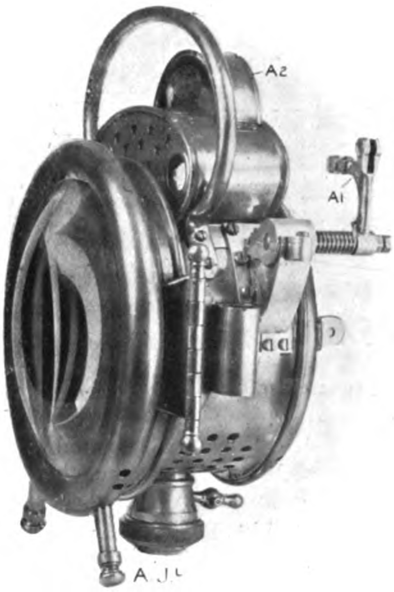


Fig. 1.—The Autoclipse Lamp. View showing the operating lever, A¹, by which the shield inside the lamp is brought into operation for the purpose of cutting off the rays from the reflector.

There is no doubt that it is the reflector which is the chief seat of the evil, for it is to this that the intensity and projecting power of the lamp is due. Standing in front of a properly adjusted reflector lamp, the flame, which is the source of the light, is quite invisible, while the whole interior of the lamp appears luminous and is of dazzling brilliance. If the reflector is taken away the lamp loses its dazzling effect, although the flame itself may be as powerful as before.

To take away the reflector is not generally feasible, although the Brewer lamp, Figs. 3 and 4, is constructed so that it can be drawn back out of focus, which has a more or less equivalent effect. On the new Autoclipse

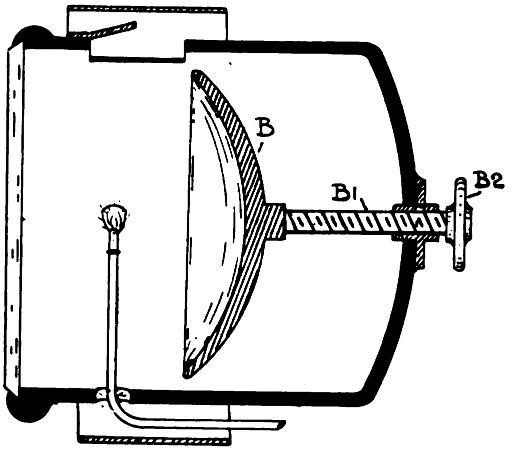


Fig. 4.—The Brewer Lamp. Sectional drawing showing the construction and method adopted for drawing the mirror, B, out of focus by the screwed spindle, B¹, and the hand-wheel, B².

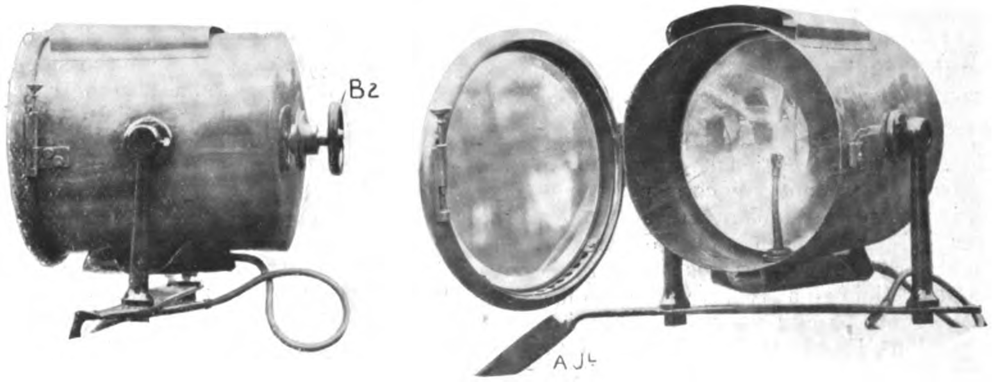


Fig. 3.—The Brewer Lamp. Photographs showing the plain glass front and the movable reflector.

lamp, Figs. 1 and 2, which has been introduced by Green and Houk, however, the reflector is ingeniously neutralised by a small dull black shield, A, which can be drawn down behind the flame when required. For this purpose the shield is mounted on a semaphore arm which is operated by a Bowden wire from the steering pillar, the wire being attached to the lever, A^1, on the outside of the case. When out of action, the shield is retained in the roof, A^2, of the lamp.

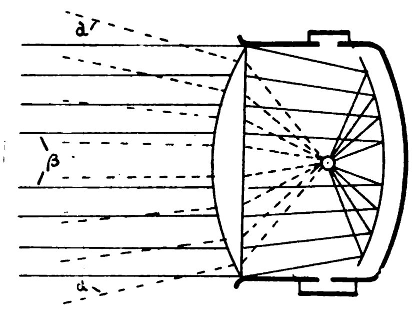


Fig. 5.—Diagram illustrating the two sets of rays which emerge from an ordinary projector lamp. Of these the α, or reflected rays, are parallel, while the β, or direct rays, are diverging.

The principle by which the shield intercepts the light is clearly shown in Figs. 5 and 6. Of these, the former diagram illustrates the normal lighting effect of the lamp, while Fig. 6 shows the result of bringing the shield into action. There are in the normal light of a projector lamp two distinct sets of rays, α and β, which are indicated in Fig. 5 by the dotted and full lines respectively. Of these the α rays radiate direct from the flame itself, they are diverging even after they leave the front lens, and they perform the essentially useful purpose of giving a diffused light, which illuminates the immediate vicinity of the car. The other, β, rays are those which shine on to the mirror, from which they are reflected through the front glass. With a parabolic mirror, the rays reflected forward by it would, of course, be parallel, but other mirrors can be used, and the same parallel rays obtained by the addition of a lens such as that shown in Fig. 5. In this case the β rays are diverging until they pass through the lens, where the refraction due to the glass causes them to be projected forward in a parallel beam.

The intensity of the light formed by the β rays naturally carries a very great distance, but it only illuminates a very small area, and consequently, were it not for the diverging α rays, there would be a deficiency in such projector lamps when applied to a motor car. This point is well illustrated in one type of Bleriot lamp (Fig. 7) where the flame is purposely set so far back in the case that it is practically invisible except to an observer actually standing right in front of the lamp. So deep is this lamp that the light emitted would be a narrow parallel beam were it not that the front glass is built up from prismatic bars of glass arranged vertically, which spread the light sideways while they prevent it from rising. All the interior of the lamp casing is finished in dull black, so that there is no reflection from the sides. In general appearance, the Brewer lamp is somewhat similar to this, but it has the flame much further forward, and utilises the great depth of the lamp-casing for obtaining an adjustment to the reflector. When the parabolic reflector is properly in focus a strong parallel beam of light is thrown from the lamp, and Mr. Brewer finds that sufficient diffused light is obtained from the sideways divergent rays which come from that part of the flame which is outside the focus. All acetylene flames are "fish-tailed" in shape, and consequently the rays emitted from the extremities of the flame strike the mirror at such an angle that they are not reflected directly ahead. This, it will be observed, renders unnecessary the use of a prismatic front glass, as in the case of the Bleriot lamp. By drawing back the reflector in the Brewer lamp, the reflected rays are no longer concentrated in a parallel beam and their dazzling effect is very much reduced in consequence.

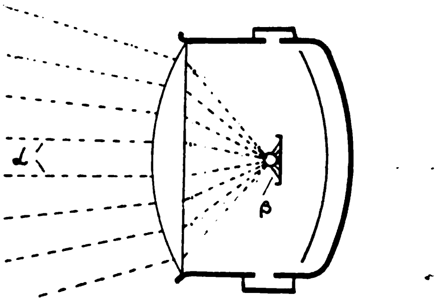


Fig. 6.—Diagram showing the effect of the shield in the Autoclipse Lamp. It intercepts the rays from the flame to the mirror, thus leaving only the α rays, which should be sufficient to illuminate the road just in front of the car.

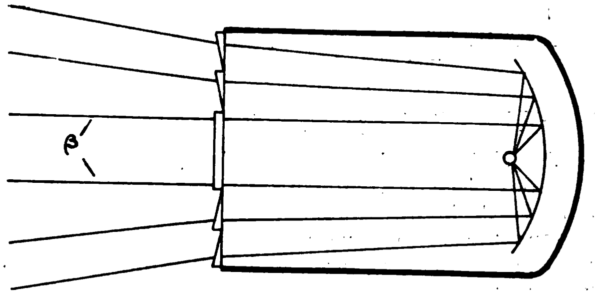


Fig. 7.—Diagram illustrating the principle of one type of Bleriot Lamp which has the flame situated right at the back of the case and the front glass constructed in a special manner to make the rays diverge sideways but not vertically.

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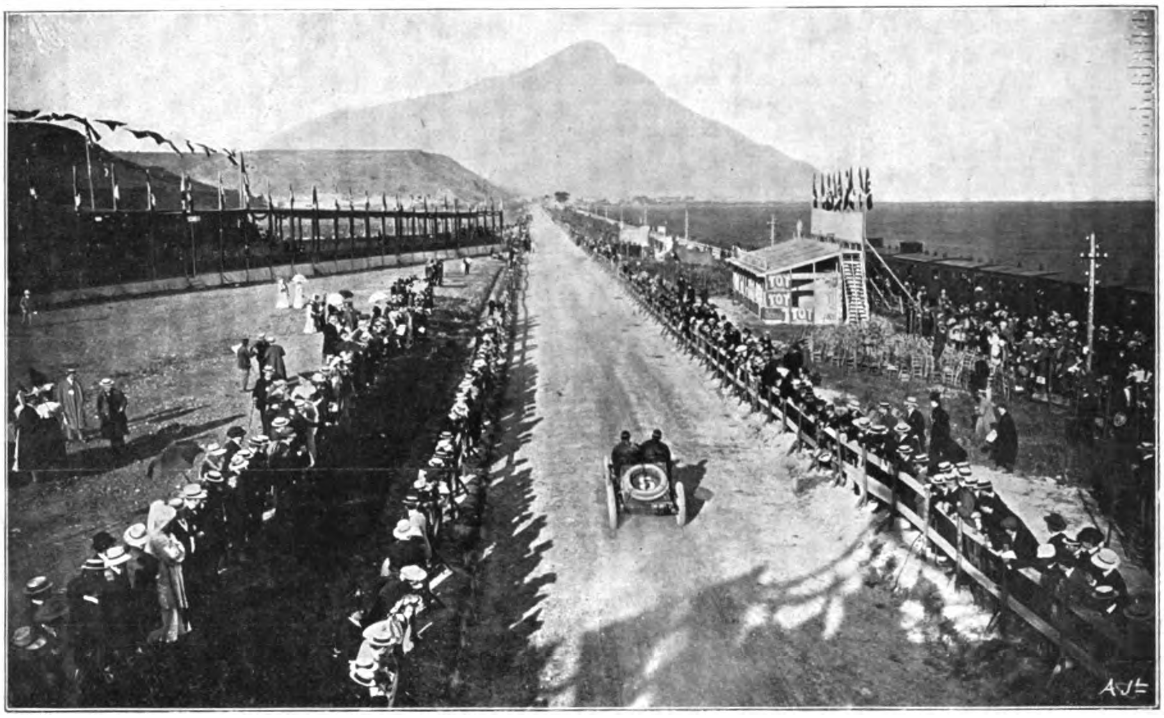
"Roadside Troubles."

THE army of "commencing motorists" is so large and so steadily growing, that there appears to be quite a demand for books designed to give practical hints in regard to the various troubles likely to overtake cars when running on the roads. Of course, the main thing in such works is to be practical, and this, it must be freely admitted, the little book bearing the above title, which emanates from the American Motor League of New York, most decidedly is. It considers very exhaustively to what particular troubles the various symptoms of "won't-go-ism" point. Two subjects which are often neglected by the amateur—the ignition and the water circulation system—come in for a special share of attention, and the general usefulness of the little pocket volume is increased by an exhaustive index.

A Book of Travel.

IN spite of the difficulties of the languages, Customs House authorities, and police officials, travelling by automobile on the Continent is growing more and more popular with English tourists, and the proprietors of the *Queen* newspaper are accordingly very well advised in issuing this "Book of Travel," which gives a most amazing amount of information in a condensed, practical, concise, and useful form for the general traveller. A feature is provided by the number of very excellent maps by which it is accompanied, and the process reproductions of photographs.

RACES, RECORDS, AND TRIALS.



THE RACE FOR THE TARGA FLORIO IN SICILY.—General view of the starting and finishing point. Bablot is seen just completing the race on his Berliet car.

Derby Hill Climbing Competition.

At Hill Cliffe Lane, near Derby, a handicap hill climb took place on Saturday last under the auspices of the Derby A.C. In order to do away with paper calculations the Club have instituted a new form of handicap. Of course, as is the case with all such arrangements, it has possible drawbacks, but judging from the extremely close finishes seen on Saturday last its success as affording good sport was amply demonstrated. One supreme advantage over all other handicaps is that the winner is proclaimed at once. All the cars are sent up the hill against the watch, and the members are expected to do their best on this trial run. The cars are then drawn in pairs and the heats run off, the slower car starting first with its time allowance, and the driver first crossing the finishing line passes into the second round, when the process is repeated until the final pair decide who is the victor. The closeness of the finishes, especially in the final and semi-final rounds, proved most satisfactory to the competitors and spectators alike, the final especially affording a most exciting finish, Mr. F. A. Bolton, a vice-president of the club and the hero of many club medals, on his 30–40-h.p. Daimler, just failing to catch Mr. Cyril Smith, driving an 8-h.p. Rover. The following were the results of the competition :—

First Round.—Fletcher, 9-h.p. Mohawk, 1 min. 50 secs. start, beat Paget, 18-h.p. White. Mell, 15-h.p Darracq, beat Eaton, 6-h.p. De Dion, 1 min. 5 secs. start. C. Smith, 8-h.p. Rover, with 43 secs. start, beat Burford, Minerva Trimo. Turnbull, 20–32-h.p. Darracq, beat Hewitt, 8–10-h-p. Humber, who took 1 min. 39 secs. start. Bolton, 30–40-h.p. Daimler, beat Clifford, 10-h.p. Minerva, 1 min. 44 secs. Leech, 18–22-h.p. Daimler, beat Joules, 15-h.p. Darracq. 38 secs. start.

Second Round.—Mell beat Fletcher, 3 mins. 13 secs. start. C. Smith, 1 min. 44 secs. start, beat Turnbull. Bolton, scratch, beat Leech, 53 secs. start.

Third Round.—Smith, with 1 mim. 6 secs. start, beat Mell. Bolton drawn a bye.

Final.—Smith, with 2 mins. 36 secs. start, just managed to reach the finishing line before Mr. Bolton, thus taking the silver medal and Mr. Bolton the bronze one.

Between the first and second rounds many of the members of the Club and their friends adjourned to the house of Mr. H. E. Currey, of Turnditch, one of the members, who had very kindly invited them to tea, and a most enjoyable half hour was spent in the grounds, where Mr. Currey, assisted by his brother and sisters and their staff, attended most assiduously to the wants of their visitors. The final round was decided about 7 o'clock, after which the cars began to disperse. As has been the case on former occasions, the weather was perfect and the roads all that could be desired. The timing arrangements were, as usual, in the hands of Messrs. C. T. Leech (hon. treasurer), and Chas. J. Allin (hon. secretary), who, on this occasion, were assisted by Mr. P. E. Joule (assist. secretary), and their labours were considerably simplified by a pair of field telephones, an innovation initiated by the Derby Automobile Club, which proved of inestimable value in the timing arrangements. The wire, of which there was over a mile, had been laid down earlier in the day by these three officials of the Club.

On Saturday next the Club, at the invitation of Mr. Francis A. Bolton, visit Oakamoor for the third year in succession, and on this occasion he has also extended his invitation to the members of the Nottingham and Leicester clubs, and as an additional attraction Mr. Bolton is offering a silver cup for an inter-club hill-climbing competition which will be contested by four representatives from each of the three clubs.

The Gearless Napier Trial.

THE following is an extract from the official report issued by the A.C.G.B.I. in connection with the 1,000 Miles' Trial of the "Gearless" Napier car—of which we gave a description and illustration last week:—

The 6-cylinder 60-h.p. Napier car completed a distance of 1,015 miles, consisting of a maximum of 211 miles per day, under ordinary touring conditions on main roads. The car weighed 1 ton 15 cwt. 1 qr., and carried four passengers weighing in addition about 6¼ cwt.

The chassis was the standard 6-cylinder 60-h.p. Napier type with live axle; direct drive on top speed with 14-tooth driving bevel-pinion and 43-tooth driven bevel-wheel; the ratio being thus 3·09 (engine) to 1 (wheels). For the purpose of this trial, the second-speed-pinion was removed; the first speed being of necessity left in position to enable the car to be reversed, but the change-speed-quadrant was so sealed as to prevent the use of the first speed without such use being at once apparent.

The record of performance on the road is as follows:—

May 7th. Engine stopped unintentionally in traffic three times. Stop to adjust number plate (two). Stop to put in petrol	9 mins.
May 8th. Drain plug came out of carburettor. Engine stopped unintentionally	55 mins.
May 9th. Engine stopped unintentionally. Tyre trouble on road. Burst	78 mins.
May 10. Stops to tighten contact maker spring, and change over accumulators (two). Tyre trouble on road. Burst	80 mins.
May 11th. Engine stopped unintentionally in traffic (twice)	3 mins.

No. of days occupied .. 5 Average daily mileage 303
Total comsumption of petrol ... ... 113 gallons.
Average mileage per gallon of petrol ... ... 8·98
Total consumption of lubricating oil (included in this are the tests at Bexhill) ... ... 4¾ gallons.
Total consumption of grease ... ... 2 lbs.

All the hills were climbed satisfactorily, it being found necessary to slip the clutch on only two or three occasions when the car had been impeded by traffic. Tests were made on the private track at Bexhill to demonstrate the flexibility of the 6-cylinder engine, the lowest speed attained being 4·45 m.p.h. over a measured quarter mile.

Belfast to Ballycastle Run.

THE annual reliability run, under the auspices of the Ulster Centre of the Motor Cycle Union of Ireland, took place on Saturday. This year the committee opened the event to small cars owned and driven by members of the Union, and fixed the date for May 5th, but owing to the fixture clashing with the motor meet and hill climb in connection with the North of Ireland Yacht Club, at Cultra, co. Down, the event was postponed to Saturday, when a start was effected at 3 p.m. from the Fortwilliam Park Shore Road, Belfast, the following members taking part in the run:—T. Ireland, 10–12-h.p. Humber; T. Clapham, 5-h.p. Cottereau; J. Garrett, 8-h.p. Rover; J. Holden, 6-h.p. Rover; P. Lavery, 3-h.p. Humber cycle; J. Stewart, 3-h.p. Triumph cycle; R. Kenneth, 3½-h.p. Coventry Eagle cycle; C. Montgomery, 3-h.p. Rover cycle. The roads in the vicinity of the city were in a fearful state, and did not improve until Whitehead was passed. From that on to Glenone the surface was fairly passable, but the stretch from Glenone to Corlough was, as usual, simply vile. After leaving Corlough the remainder of the journey was of a more pleasing nature, and the competitors, keeping in sight of each other, careered along at a merry bat, and reached their destination, the Atlantic Hotel, Ballycastle, just on time, all claiming a "non-stop" certificate.

North of Ireland Hill-Climb.

ON Saturday last, in fine weather, the annual motor meet, instituted by the committee and members of the Royal North of Ireland Yacht Club, in connection with the opening of the season, took place at Cultra, co. Down. The hill-climbing contests were decided on a stretch of road within the private grounds of Mr. R. J. Kennedy, D.L., C.M.G., Cultra Manor, who, as on a former occasion, placed the venue at the disposal of the committee. The event, which was a handicap, was divided into three classes: Cars over 15-h.p., cars under 15-h.p. and over 10-h.p., and cars under 10-h.p.; and 25 competitors came under the starter's control.

The following are the details:—

CLASS A.—*Cars 15-h.p. and over.*

1. Major McCalmont's 40-h.p. Minerva, 1 min. 30 secs.
2. Granville Craig, 15–22-h.p. Daimler, 1 min. 24 secs.
3. F. Workman, 15-h.p. Darracq, 1 min. 25 secs.
— J. Cunningham. 30–40-h.p. Daimler, 56 secs.
— H. Barbour, 35-h.p. Daimler, 1 min. 12⅗ secs.
— H. C. Craig, 28–36-h.p. Daimler, 58 secs.
— R. Gaffikin, 20–30-h.p. Darracq, 1 min. 20⅗ secs.
— V. Craig, 18-h.p. Mercedes. 1 min. 58⅘ secs.
— W. F. Workman, 15-h.p. Watier, 1 min. 51⅗ secs.
— E. Craig, 15-h.p. Panhard, 2 mins. 41⅕ secs.
— C. Lepper, 15-h.p. Darracq, 1 min. 43⅕ secs.

CLASS B.—*Cars of 10-h.p. and not up to 15-h.p.*

1. F. Gardiner, 10–12-h.p. Humber, 1 min. 32 secs.
2. W. H. Carson, 10–12-h.p. Argyll, 1 min. 33⅗ secs.
3. R. E. Workman, 14-h.p. Minerva, 1 min. 20⅗ secs.
— J. G. Crawford, 12-h.p. Clement, 2 mins. 48 secs.
— W. Hume, 14-h.p. Minerva, 1 min. 51 secs.
— Dr. Bryce Smith, 12-h.p. Darracq, 1 min. 51 secs.
— R. Workman, 12-h.p. Darracq, 1 min. 49⅗ secs.

CLASS C.—*Cars under 10-h.p.*

1. J. W. Lennon, 6.h.p. De Dion, 1 min. 53 secs.
2. A. Craig, 5-h.p. Oldsmobile, 2 mins. 14 secs.
3. Dr. W. Donnan, 8-h.p. Darracq, 2 mins. 12⅕ secs.
— T. W. Bloxam, 9-h.p. Darracq, 2 mins. 38⅘ secs.
— R. A. Mitchell, 8-h.p. Chambers, 2 mins. 52⅕ secs.
— D. J. Mitchell, 8-h.p. Chambers, 3 mins. 10⅕ secs.
— H. C. Craig, 7-h.p. Oldsmobile, 2 mins. 53 secs.

Frome's Hill Climb.

TO-DAY (Saturday) is the last day for entries to be received. We understand that the list is expected to total to about sixty.

Yorkshire Speed Trials.

THE Yorkshire A.C. have decided to hold this year's speed trials on the sands between Saltburn and Marske. The sands have been inspected by a sub-committee, and are found to be eminently suitable for the purpose of holding speed trials. The agent of Lord Zetland, and the District Councils of Saltburn and Redcar, have been approached, and their sanction obtained to the speed trials taking place on the sands, provided that the course is properly protected, which will be done, as the club is determined not to have a repetition of what took place at Filey last year. The Superintendent of Police for the district has intimated his willingness to undertake the duty of protecting the course, and the club will work in co-operation with him, and if found necessary over a hundred police officers, and several mounted police, will be engaged.

West Surrey A.C. Hill Climb.

The annual hill-climbing competition of the club was held on the 12th inst. over a course of one mile near Pirbright, permission having been accorded by the Aldershot authorities. The average gradient was 1 in 25, and the maximum near the finish, 1 in 9½ for a short distance.

Over 110 members and guests were present at the competition, which was followed by an *al fresco* tea at the summit of the hill.

The chief results of the handicap, which was framed by the A.C.G.B.I., were as follows:—

	Car and Owner.	Allowance.	Gross Time.	
	Class I.—*Over 12-h.p.*			
		secs.	m.	s.
1	28-h.p. Pipe (R. McGaskell)	22	1	55
2	14-h.p. Renault (A. Leon)	12	2	25
3	14-h.p. Renault (G. A. Houghton) ...	22	2	55
4	16-h.p. Humber (R. C. Treatt) ...	Scratch.	2	35
5	28-h.p. Daimler (O. O. Wrigley) ...	3	2	40
6	14-h.p. Renault (R. W. Buttemer) ...	19	2	59
	Class II.—*12-h.p. and Under.*			
1	12-h.p. De Dion (A. C. Tessier) ...	57	2	39
2	8-h.p. Clement (J. F. Ponsford) ...	76	3	22
3	12-h.p. Argyll (Dr. A. Fennings) .	27	2	49
4	10-h.p. Argyll (W. C. Houghton) ..	69	3	34
5	8-h.p. De Dion (Dr. Minchin)... ...	132	4	40
6	8-h.p. Cadillac (Col. Rawstorne) .	50	3	50

Scottish Reliability Trials.

We are asked by the British agents for the Metallurgique cars to state that, although the car entered by them in these trials is referred to as a 44-h.p. vehicle in the official programme, it is one of their standard 30–35-h.p. that is to take part in that important forthcoming contest.

150 Miles' Car Competition.

The competition for the Albert Brown Trophy, which is run under the auspices of the Motor Cycling Club, is taking place to-day (Saturday). The trial is one for cars only over a distance of 150 miles on a circular course of 75 miles to be covered twice, with a luncheon interval af 1½ hours at the point of starting. Originally the competition was for "all British built cars" only, but it has been decided, in view of many cars belonging to members being rendered ineligible under that definition, that cars may be entered to compete of which the following parts are of British manufacture, viz, engine and transmission, frame, body, and road-wheels, excluding the tyres. Any four-wheeled car of any horse-power may compete. Average minimum speed must be maintained of 18 m.p.h.; maximum, 20.

The contest will be decided by means of marks. Five marks will be lost for every minute of involuntary stops, except for tyre repairs and traffic. Marks will also be lost on the basis of petrol consumed per ton per mile. A car weighing 20 cwt., fully loaded, will thus lose 40 marks for every gallon of petrol consumed during the whole of the trial; a car weighing 10 cwt. will lose 80 marks per gallon consumed, and a car weighing, say 8 cwt., will lose 100 marks per gallon consumed. The proportions remaining constant for any fractions of weight, irrespective of horse-power, and for any fraction of a gallon.

The car losing the least total number of marks will be declared the winner of the Trophy.

In addition to the Trophy to the winner, a gold, silver, and bronze medal will be awarded respectively to the winner, second, and third cars. Certificates will be given to cars accomplishing 'non-stop" runs. One hour over maximum time from any cause whatever will disqualify. Cars must be driven throughout the trial by the entrant, who must be a member of the Motor Cycling Club.

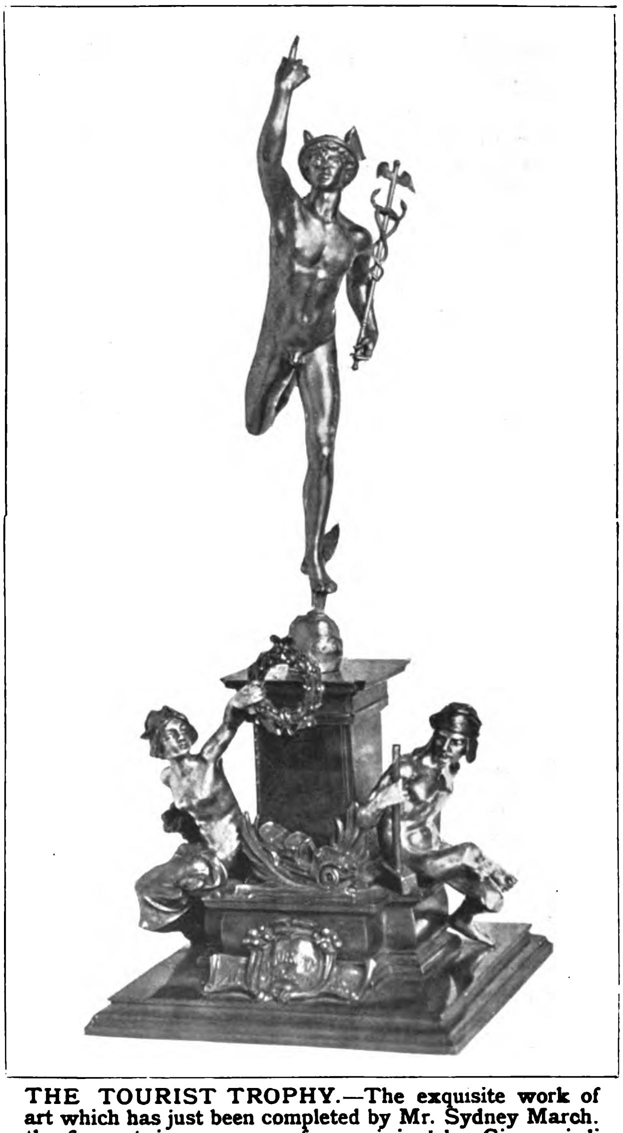
The Club has secured the services of Mr. F. T. Bidlake to act as timekeeper for the whole of the season's events.

Daimlers score again in America.

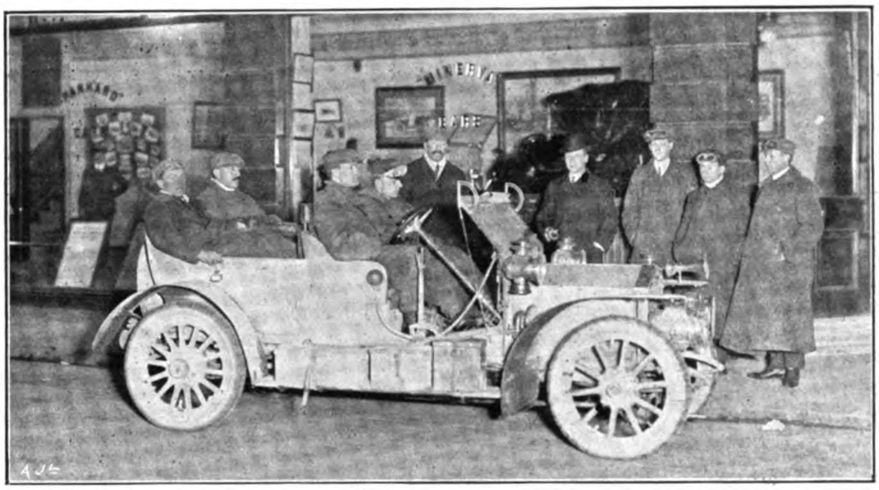
A 45-h.p. Daimler car, driven by Harding, is announced from America, as the winner, in 2 mins. 11⅕ secs., of the Wilkesbarre (Pa.) hill climb, with a 6-cylinder Stevens second in 2 mins. 27 secs. The distance is 1⅛ miles, with an average gradient of 15 per cent., the steepest part being 27 per cent.

"Tour de France."

Owing to the strikes the date for this event has been changed to May 22–June 3.



THE TOURIST TROPHY.—The exquisite work of art which has just been completed by Mr. Sydney March. the figure being a copy of an original by Giovanni di Bologna at Florence.



Flashlight photo by Argent Archer.

MONTE CARLO TO LONDON BY CAR.—The return of the Hon. C. S. Rolls on his 20-h.p. Rolls-Royce Car at midnight on May 11th.

Monte Carlo to Boulogne by Car in 28¼ hours.

LAST week we announced that a trial run between two Rolls-Royce cars—one of them being a new model and the other the Tourist Trophy car of last year—was being carried out between London and Monte Carlo. Unfortunately Mr. Percy Northey, who was driving one of the vehicles, had to return to London by train, and the comparative figures, which were to have been obtained on the return journey, are therefore not available. In order not to entirely lose the opportunity, however, Mr. Rolls decided to try and set up a new record between Monte Carlo and Boulogne—a distance which had previously been covered by Mr. Charles Jarrott on his 40-h.p. Crossley, but in the reverse direction, in 31 hrs. 35 mins.—and he accordingly started off with a full load of four passengers for this 771 miles "non-stop" run. In spite of some heavy rain and the delay caused by one puncture, Boulogne was reached in 28 hrs. 14 mins., which is equivalent to an average speed of 27·3 miles per hour. The car which Mr. Rolls drove is the new model designed for this year's Tourist Trophy Race, and it was shod with Dunlop tyres.

That the run was in the nature of an "experience" for those concerned is shown by the following extract of an interesting letter we have received from Mr. Rolls giving an account of his run :—

"The first delay occurred on entering Nice, where the Octroi officials examined everything in the car, and, notwithstanding that we declared exactly what we had got, insisted on pulling out and opening all our packets and hampers of provisions most carefully packed up, and charged us duty on some bottles of champagne, and all our spare oil and petrol, taking eight minutes to make out forms which they insisted on our waiting for. The Esterels Mountains, averaging 1 in 10 to 1 in 15, were taken mostly on the direct third gear. The principal towns then passed through were Frejus, Brignoles, Aix, Orgon, the outskirts of Avignon, and Orange ; here we had our first voluntary stop at the excellent Hotel du Louvre et de la Poste, where we took in petrol and supplies of food—distance about 190 miles. Continuing through Montelimar, we lit up our lamps near Valence, and on reaching Vienne we had our first and only puncture. We stopped to repair, and also had some refreshments.

"Leaving Vienne we felt the first drop of rain—the day had been very hot and sultry—and as the night wore on the sky grew blacker, flashes of lightning darted across the clouds, and soon after passing through Lyon a perfect deluge of rain began. We had taken in petrol and re-charged our acetylene lamps at the garage Lafayette, in Lyon, up to which time our running had been very good, well over 30 miles per hour average being maintained, including the mountain portion ; now, however, the beautiful white roads were converted into rivers of liquid slush, and soon everything on the car, including provisions—and passengers, too—were soaked through ; a steady downpour had seemingly set in for the night, and the rain drops were so big that it was quite impossible to drive against it at any speed, as one literally could not keep one's eyes open, so we had to slow down to considerably less than half speed, and even then our faces suffered considerable pain.

"We practically gave up all hope of getting to Boulogne the following day, for this was the worst night any of us had ever driven through, and our speed had perforce to be slow ; to make matters worse, we several times lost our way completely, getting off the main road, and had to wander about from signpost to signpost till we could find one with something on it we could recognise.

"The reading of our maps during the night was fortunately rendered easy by a new electric breast lamp, which was kindly lent to us by the Portable Electric Light Company, and which I can recommend as a great convenience for a passenger to wear on a night run ; their electric torches are also a great convenience for reading signposts in the dark.

"Another great source of delay was the extraordinary difficulty we had at the various level crossings in the neighbourhood of Macon and Chalons, in waking up the gatekeepers in their houses, and getting them to come out during the night and open the gates. We had to wander about with lamps, hammering at all the windows and doors before we could make anyone hear. At the entrance to some of the large towns, too, they have big gates across the road at night time, kept by the Octroi officials, and these officials when once asleep do not see the fun of turning out in pouring rain, in the early hours of the morning, to let a motor car or anything else through.

"At daybreak, fortunately for us, the rain began to lessen, and before we reached Dijon it had entirely ceased, which raised our spirits once more. We arrived at Tonnerre at 6 a.m., and here decided to effect a complete change of clothing, being soaked to the skin ; we also took in petrol and oil at the Hotel de Lion d'Or.

"The sky had now cleared, and we had fine weather for the rest of the run, which, so far as the running of the car was concerned, was as uneventful as the first part.

"We passed through Sens, Melun, and avoided Paris by taking a somewhat complicated route with a good deal of pavé *via* Versailles, St. Germain and Pontoise ; at Beauvais we took in our last supply of petrol at the Hotel de France, and continuing *via* Poix, Abbeville, and Montreuil, we arrived at Boulogne Quay at 3.19 p.m., being ourselves really astonished with the performance of the little 20-h.p. car which, including all stops, had averaged 27·3 miles an hour for the whole distance, with four passengers and a heavy load of spares, baggage and provisions.

"The tyres, which were light Dunlops, behaved exceedingly well throughout, the one puncture we had being caused by a long sharp nail which would have gone through anything.

"As regards food, we existed almost entirely on Plasmon 'lunch packets,' and on soup, coffee, cocoa, &c., which we were able to have hot at any time by means of the Calorit chemical heaters, supplied by Poulton and Noel. I need hardly say it made an immense difference to our comfort, especially during the night in the pouring rain, to be able to have hot drinks and soup periodically without any flame or trouble."

Two Gallon Efficiency Test.

IN the above American event, in the class for 4-h.p. single-cylinder cars, the best performance was made by E. P. Chalfant's Orient Buckboard, 101 miles, a similar make being second with 94 miles. Some question having been raised in regard to the distance covered by the Franklin and Frayer-Miller cars, as reported by us last week, they were called upon by the organising committee to re-run the test, with the result that the 12-h.p. Franklin covered 95 miles (against 87 miles on the first occasion), and the 24-h.p. Frayer-Miller made 60 miles, against 48 miles previously. The results are :—(1) Franklin, (2) Frayer-Miller, (3) Darracq, (4) Berliet.

The Tourist Trophy in the charming silver casket in which it is permanently contained. Our photograph shows the doors of the casket thrown open.

Milan Gold Cup Trial.

No less than forty-eight cars started from Milan for Bologna on Monday last in this remarkable test for touring cars, organised by the Milan A.C. On April 28th, in The Automotor Journal, full particulars of this eleven days' contest were published, together with a profile of the route, the latter conveying very vividly the extremely trying ordeal through which the competing cars would have to pass. Amongst the starters, and the first away at 4.30 a.m., was Grigg, on a 30-h.p. Daimler; he, however, was unfortunate in missing the road, and therefore losing the lead, and was ultimately placed *hors de combat* by being overturned at a bad corner—a Mercedes and a Fraschini shared the same fate, fortunately without any other very serious results. Great Britain, nevertheless, was well to the fore with Macdonald, on a 6-cylinder Napier—curiously the second car to start from Milan, as the result of the ballot—and with the Daimler "off the track," Macdonald's became the "pilot" car, a position no other competitor had the slightest chance of disputing during the long day's run of 237 miles. He arrived at Bologna to the minute at the minimum official time in perfect trim, as did also his 6-cylinder Napier garage companion driven by Glentworth. The three Fiat cars, Cormier's De Dion, the Italas, the Isotta-Fraschinis, and the Martinis were amongst the other cars which were chiefly prominent by their fine speed performances. Altogether seven cars were eliminated on this day. On Tuesday the run was to Rome, 282 miles, in which about six mountain passes had to be surmounted. In contrast to the splendid weather of Monday, the cars had to drive through hail and torrential rain, which converted the roads into veritable quagmires. Macdonald still, however, maintained his leading position on the 6-cylinder Napier, and Glentworth, after advancing on the first day from twenty-third to twelfth place, on Tuesday was the eighth arrival at Rome. By way of compensation for the fearful experiences of this day, at Rome the King of Italy personally drove out on a motor car to greet the travellers on their arrival. On Wednesday, the destination was Naples.

The following are the cars and their drivers which started from Milan, at two minute intervals, in the order given :—

h.p.	Car and Driver.
35	Daimler (Allan D. Grigg).
40	San Giorgio, Napier (A. Macdonald).
18–24	Peugeot (G. Campana).
24	Itala (Cagno).
28	Zust (Marsaglia).
30–35	Ariès (M. Cocquard).
24	O.T.A.V. (Lanfranchi).
40–50	Florentia (Galli).
28–32	Marchand (Raggio).
24	F.I.A.T. (Lancia).
24	Rapid (Cariolato).
28–35	Isotta Fraschini (Trucco).
60	Mercedes (Renaud).
20–24	Diatto-Clement (Vercellone).
35–40	Benz.
30–40	Martini (J. Beutler).
24	De Dion-Bouton (L. de Dion).
20–24	Bianchi (Tommaselli).
40	San Giorgio, Napier (Glentworth).
24	De Dion-Bouton (Nagliati).
28	Zust (Maggioni).
40–50	Florentia (Spinelli).
28–32	Marchand (Tamagni).
24	F.I.A.T. (Nazzaro).
24	Rapid (Ernesto).
28–35	Isotta Fraschini (Gremo).
24–28	Mercedes (de Montel).
20–24	Diatto A. Clement (Bussolotti).
35–40	Benz.
30–40	Martini (Von Lüde).
24	De Dion-Bouton (Cormier).
24	Itala (Graziani).
28	Zust (Conti).
28–32	Marchand (San Donnino).
24	Fiat (Boschis).
24	Rapid (Berutto).
28–35	Isotta E. Fraschini (V. Fraschini).
20–24	Diatto A. Clement.
35–40	Benz.
30–40	Martini (de Martini).
24	Itala (Fabry).
28–35	Isotta e Fraschini (Minoia).
24–30	Clement-Bayard (E. La Manna).
28–35	Isotta e Fraschini (Giavanzani).
12–16	Diatto A. Clement (Buzio).
35–45	Diatto A. Clement (A. Baseir).
20–24	Diatto A. Clement (Scholsshauer).
35–45	Diatto A. Clement (L. Colenet).

Algerian Hill-Climb.

The winner of the "Coupe Jean Homolle," over the 10-kilom. hill, from Tablat to Sakamody, is M. Narbonne, with a 20-h.p. Pilain, in 18 mins. 37 secs. In Class 2, the winning car was a 12-h.p. De Dion, 23 mins. $23\frac{1}{5}$ secs.; in Class 3, a 15-h.p. Darracq, 23 mins. $17\frac{3}{5}$ secs.; and Class 4, a 20-h.p. Renault, 18 mins. $36\frac{1}{5}$ secs. The cup goes to the car making the best time in the category in which there are the greatest number of starters, hence the award to M. Narbonne.

Humber Top-Gear Run.

Long journeys on the top-speed have evidently spread to Australia, for we learn that a 10–12-h.p. Humber car, properly "observed" throughout, has just successfully completed a 24 hours' trial, during which time a distance of 556 miles was covered without changing speed.

London to Edinburgh 24 Hours' Motor Run.

This annual event, organiged by the Motor Cycling Club, will take place this year on June 1st. Motor cars for the first time are eligible to enter in the event, and a competition for a 30-guinea cup will be held in conjunction with the run. The start will be from the top of Highgate Hill at 10 p.m., and Edinburgh is to be reached not later than 10 p.m. the following day.

THE DESTRUCTION OF SAN FRANCISCO AND THE HELPFUL MOTOR CAR.

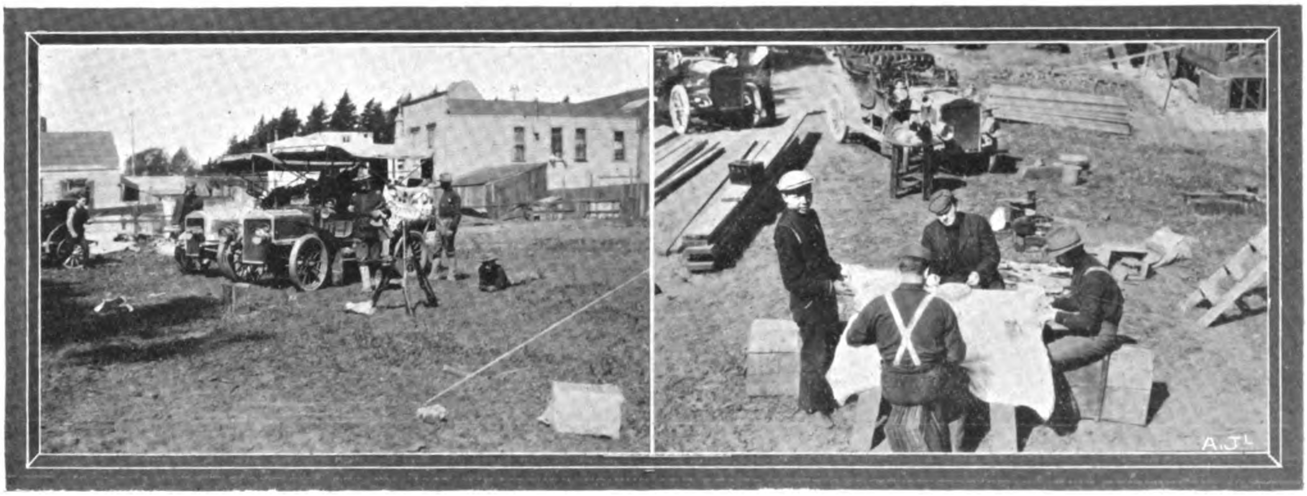
THE DESTRUCTION OF SAN FRANCISCO, AND THE HELPFUL MOTOR CAR.—The welcome water wagon and the "bread line," where food was distributed to all comers, and which the motor cars helped to keep supplied.

THE frightful disaster at San Francisco is now a tale that is told, but some of the leading features of the catastrophe remain fixed in the imagination of everyone. Chief among them, perhaps, was the tragic collapse of the water supply at the very moment it was most needed for extinguishing the terrific conflagration which followed almost instantaneously on the steps of the earthquake. Only one method of staying the devouring flames proved of the slightest use, and that was to blow up whole streets with dynamite. For this transport was needed, and yeoman service was rendered by the automobiles present in the city, or which came to help, and carried out the dangerous, we might almost say heroic service, of transporting large supplies of the explosive from the depôts where it was stored to the spots where it was required to perform the needed destruction. In addition, the cars proved of the utmost utility in enabling the authorities in charge of the city to know what was happening in different parts of it, telephone and telegraphic communication being, of course, completely interrupted, while, subsequently, scarcely less important work was performed in distributing supplies and bringing succour to the injured.

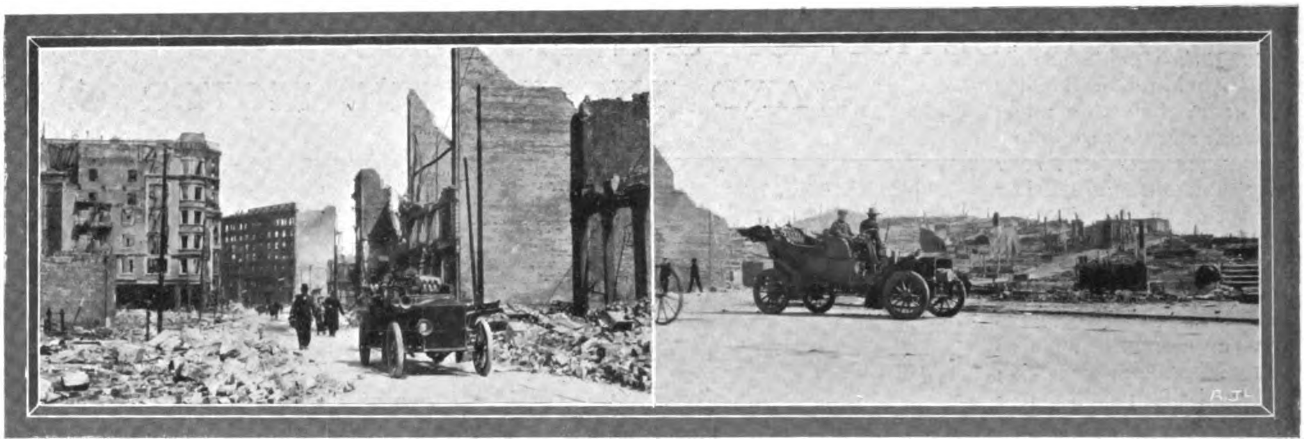
The experience of Mr. Walter C. White, of Cleveland, will give a good idea of the part played by the motorist in lightening the burden of the people of the afflicted city. Mr. White, who is well known in motoring circles in this country, was on his way home from the City of Mexico, and was in Los Angeles when the earthquake occurred. As soon as the extent of the disaster to San Francisco became known, he determined to hurry there, realising that every vehicle would be useful.

The following description of Mr. White's errand of mercy from the pen of a local correspondent, is of high interest :—

"Accompanied by Captain Ryus and Bert Dingley, Mr. White left Los Angeles on the afternoon of the day of the disaster, in a White steam car, and with throttle wide open, steered for San Francisco. Under ordinary circumstances the car would have made the distance, 475 miles, well under 24 hours. But hardly had Mr. White and his companions started on their trip, than they realised that it was a more than ordinarily arduous task that they had undertaken. Telegraph poles, felled by the shock, lay across the road, and had to be chopped



THE DESTRUCTION OF SAN FRANCISCO, AND THE HELPFUL MOTOR CAR.—In the left picture is seen the head of the Commissary Department, and his car, taking a short rest. and on the right the drivers of the cars are lunching in their "camp." Hawkins, the well-known driver for the White Company, is seated at the further side of the table.



THE DESTRUCTION OF SAN FRANCISCO, AND THE HELPFUL MOTOR CAR.—The destruction in Eddy Street (in the left photograph) and a general view of the ruins is seen in the right. In these pictures, as in several others which we publish, Mr. Walter C. White is at the wheel of one of the White Steam Cars which took such active part in helping in all directions, during the destruction which followed the disastrous earthquake.

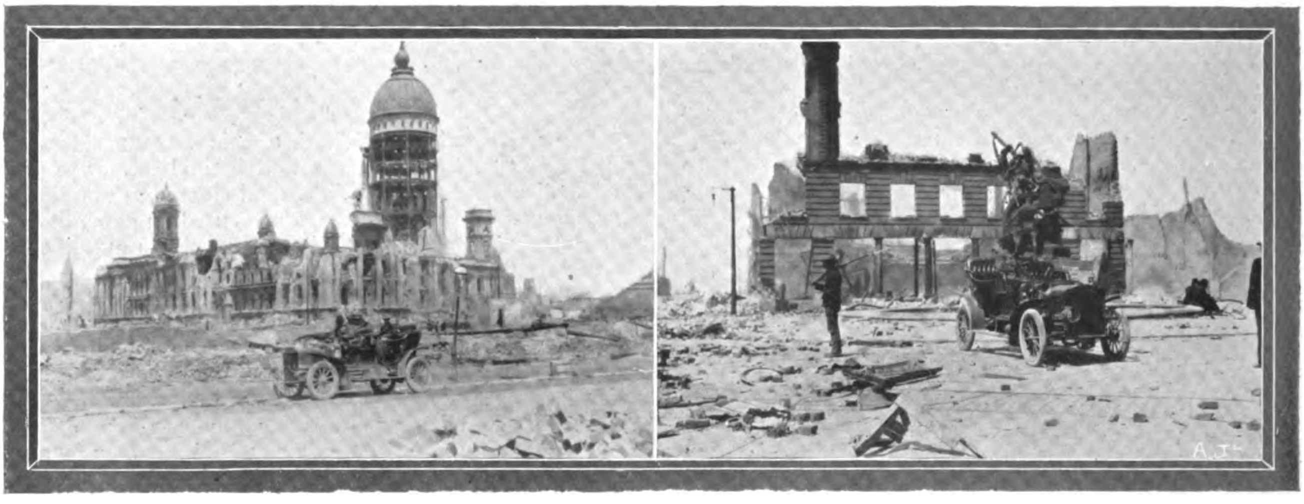
away or otherwise removed. Bridges over the numerous streams were missing, and fording places had to be sought, or when this was impossible, boats of any old kind were pressed into service. Many of the villages passed through were in ruins, and their main streets all but impassable. Most appalling of all were the fissures in the roads. What was formerly a stretch of the finest boulevard on the coast was a hopeless stretch of chasms and ruts. More than once the tourists searched for miles for planks to bridge over gaps in the road. Probably every man in the party toiled as he had never toiled before. No time was lost, and the men took turns at the wheel, driving day and night.

"But pluck and determination won; and on Friday noon, Mr. White and his companions saw before them the smoke and flame from what had been hardly two days before the proudest city of the Pacific.

"As soon as the machine reached the city limits it was at once surrounded by a detachment of United States troops. 'We want your car,' said the sergeant. 'Get out.' 'All right,' said Mr. White, preparing to comply, 'but how about a driver?' The sergeant looked surprised: he had not thought of that part. Mr. White spoke up quickly. 'I will drive; that is why I came here.'

"Immediately the sergeant climbed into the car and said, 'To Mechanics' Pavilion. The wounded were put there the first day; now flames threaten the building.' In less time than it takes to tell, the tourists were carrying the sufferers to places of safety. Scores of other machines were engaged in the same task. The driver of one of the other machines was Mr. C. A. Hawkins, the San Francisco manager of the White Company. He and Mr. White spied one another. The two men, old-time friends, had not seen each other for months. A mere nod was exchanged. To each one of them it seemed perfectly natural that the other should be there engaged in the humane task. A minute wasted in exchanging greetings might have meant one less sufferer removed from the path of flames.

"When the wounded had been removed attention was turned to removing the dead. Before the buildings burst out into flames there was time enough to carry away in the autos most of the bodies, not all.



THE DESTRUCTION OF SAN FRANCISCO, AND THE HELPFUL MOTOR CAR.—The varying effect of the disaster may be gathered from the state of the five-million dollar City Hall (in the left photo), after the earthquake. The manner in which the steel girders in so many cases remained intact in their place, whilst the lining of bricks peeled completely, away is very clearly seen. The Donohue Monument, which remained unharmed by the shock and the fire, is seen in the right photo.

THE DESTRUCTION OF SAN FRANCISCO, AND THE HELPFUL MOTOR CAR.—**The above photograph shows the comparatively slight extent to which many of the buildings were damaged by the earthquake in Oakland, just across San Francisco Bay.**

"'What next?' asked Mr. White of the sergeant who was still in his car. 'Dynamite—to Nob Hill—supply of it at the end of this street' was the reply. A quick trip of the car loaded with explosive, a few moments spent in placing it under the walls, a warning signal, a deafening concussion, a million dollars' worth of property blown to atoms. Another quick trip to the supply depôt—another million dollars' worth wiped off the map.

"How did the firemen know which block of buildings to blow up? Because the army officers in charge of the city were carried in another car all over the city, and saw exactly where the fire was making most progress and where it was burning itself out. Not much sleep for the drivers of cars.

"What a relief it was when the flames were under control. Then came the other work. There were a quarter million of people homeless and without food. How was the food to be distributed which sympathetic humanity outside the city was sending in by the train load? By automobiles, of course.

"When there is compiled the story of the heroism of those who faced the greatest disaster in this epoch, let there not be forgotten those resolute men who sat at the steering wheels of their cars for hours and for days knowing not fatigue, and realising only that the comfort, the safety, even the lives of their fellow-men depended in a large measure upon their efforts."

* * * *

CLUBS AND ASSOCIATIONS.

A.C.G.B.I.

THE membership of the Automobile Club is now over 2,900, and amongst the most recent members elected are included: Lieut.-Col. Chas. E. Parker-Jervis, Major J. T. Cotesworth, the Right Hon. Baron Elphinstone, Major W. H. Feilden, J.P., Sir John P. Lister-Kaye, Bart., Col. H. B. Hamilton, Sir Shirley H. Salt, Bart., the Earl of Aberdeen, Dr. E. Distin Maddick, Brig.-Gen. G. F. Francis, Mr. J. Prichard-Jones, J.P., Dr. James Horlick, D.L., J.P., the Right Hon. Sir Robert Finlay, K.C., Maj.-Gen. Lord Cheylesmore.

The following gentlemen were elected stewards of the club for the ensuing year at the meeting of the General Council held specially for that purpose on April 30th:—1. The Duke of Sutherland, K.G.; 2. The Earl of Onslow, G.C.M.G.; 3. Earl Russell; 4. Lord Stanley, C.B.; 5. Sir David L. Salomons, Bart.; 6. Sir J. H. A. Macdonald, K.C.B.; 7. Sir W. G. D. Goff, Bart; 8. The Hon. Arthur Stanley, M.P.; 9. Col. H. C. L. Holden, R.A., F.R.S.; 10. Lieut.-Col. Mark Mayhew; 11. Mr. Chas. Hardy; 12. Mr. E. H. Cozens-Hardy.

British Empire Motor Trades Alliance, Limited.

THE following firms have recently been elected to membership:—Enfield Autocar Company, Limited, J. B. Brooks and Co., Limited, H. J. Mulliner and Co.

Derby A.C.

LAST Saturday the Club held a hill climb at Hill Cliffe Lane (reported elsewhere), and an inter-club hill climb is to take place to day (Saturday), and, at the invitation of Mr. F. A. Bolton, Moor Court, Oakamoor will be visited. On June 2nd the hill climb for the Du Pré Challenge Cup (Notts, Derby, and Leicester Clubs) takes place; on July 14th a gymkhana will be held at Burton-on-Trent, and on July 28th another hill climb, for which a challenge cup is offered.

In reference to the abandonment of massed club runs by the Motor Union, on account of the dust caused, the hon. secretary of the Derby Club informs us that they decided on this step more than two years ago, and that they invariably appoint a meeting-place, and leave the route to be selected by the members.

Kensington A.C.

NOT much time has been lost by the executive of the club in getting to work for the benefit of its members. The opening meet took place last Saturday, the venue being Banstead Downs, the following members being present:—T. C. Owen (Panhard), H. E. Rodwell (Darracq), Prof. V. Spiers (De Dion), Dr. W. H. L. Copeland (White), Mrs. Grylls (White), J. H. Reeves (Orleans), J. J. Rawlings (Kensington), Dr. W. S. Cox (Panhard), W. H. Mapplebeck (Winton), Dr. L. C. Dobson (Humber), Dr. V. A. L. E. Corbould (Richard-Brasier), W. R. Beilby (Spyker), W. H. Thompson (Prosper-Lambert), E. F. Philbrick (Mors), E. Bridgland (Vinot), D. J. Muirhead (Whitlock-Aster), R. E. Haywood (motor cycle). A considerable number of members regretted inability to attend, the most prevalent reason being "car not yet delivered." The official photographer not appearing, amateur efforts were called into play, after which, by various routes, a move was made to the Burford Bridge Hotel, where close on fifty members and their friends took tea. Later, at varying intervals, the cars started homewards, the verdict being unanimous that the initial meet must be voted a success.

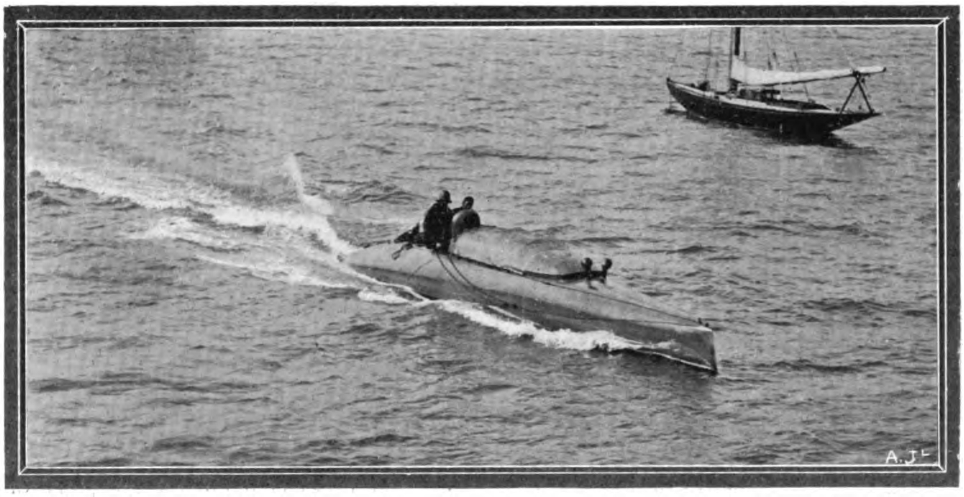
Society of Motor Manufacturers and Traders.

THE society have voted sums of £100 each to the Motor Yacht Club and the British Motor Boat Club, and a further sum of £50 in connection with the reliability trials of motor boats to be held this year.

The following is a list of firms who have recently joined the society:—The Electric Ignition Company, Limited, J. Tyler and Sons, Limited, the Deasy Motor Car Manufacturing Company, Limited, E. Kalker and Co., Ross Courtney and Co., Ltd., E. Richards and Sons, Easton Motor Company, Premier Motor Co., Ltd., Hall, Capis and Co., Ltd., H. Adams and Co., J. Maythorne and Son, Ludw Loewe and Co., Ltd., Mann Egerton and Co., Ltd., Métallurgique Cars, Autolac Syndicate, E. W. Morgan and Co., Ltd., Gaulois Tyres, Quadrant Cycle Company.

Wolverhampton A.C.

MR. S. R. RHODES announced his resignation as hon. secretary of this club, owing to a very severe illness through which he has just come, his resignation being in consequence of an imperative injunction from his medical advisers. Mr. Rhodes' connection with the club has been of great benefit to the industry, he being the convener of and chairman at the meeting on January 4th, 1901, when the formation of the Wolverhampton Club was resolved upon. In retiring from the position of hon. secretary of the club, he has addressed a very straightforward letter to Mr. T. Cureton, the president of the club, and in this he strongly urges the members to support his successor, Mr. A. W. Moore, in the same whole-hearted and considerate manner in the discharge of his duties which has been accorded to himself during the five years of his connection with the club.



IN SOUTHAMPTON WATER.—"Hutton II" showing her paces round the "Enchantress."

MOTOR BOATING.

"Napier Major's" 2,000 Miles Cruise.

AFTER doing duty as Press boat at the British Motor Boat Club opening meeting at Kingston on May 5th, "Napier Major" ran down the river on the Sunday to Greenhithe, where she anchored for the night. A start was made on Monday morning, and on Wednesday she was sighted in a heavy gale and high sea at Hartlepool, which is nearly half-way to Inverness.

Pearl of the Mediterranean.

IT is now announced that this motor boat race round Sicily has been abandoned for 1906.

A New Motor Cargo Boat.

MESSRS. PICKFORD have recently taken delivery of a new motor-driven cargo boat, entitled "The Wasp," which is to be used to carry cargo in Portsmouth and Southampton.

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AERONAUTICS.

The Sport of Airshipping.

NAVIGABLE airship building is becoming quite a craze in the United States. It is said that the latest victim to the mania is Mr. W. M. Murray, the President of the Standard Automobile Company, who is having an airship 42 feet long, named the "Splinter," built for him.

The La Vaulx Airship.

COUNT DE LA VAULX, who has just returned from America, has proceeded to the preliminary inflation of his airship in the Parc of the Aero Club de France. The new machine has a cigar-shaped gas-vessel of a capacity of 700 cubic metres, constructed of caoutchouc tissue composed of two layers of caoutchouc and three of fabric. The length of the gas-vessel is 35 metres, and the maximum diameter 7 metres. It is provided with the customary compensating ballonette inside, and two flaps extending the length of the gas-vessel provide suspension by means of ring-bolts for the cords from which the hull is hung, at some 7 metres below the bottom of the gas-vessel. The machine is to be propelled by a four-bladed propeller mounted in front, and close up under the gas-vessel, the transmission to which from the motor is effected by a series of cardan shafts. The motor with which the airship is provided is a 16-h.p. 4-cylinder Ader, with air-cooling, while a square rudder is mounted at the rear. The preliminary inflation, which will be carried out with coal gas, is merely to enable the machine to be tested before actual evolutions are performed with it.

MOTOR CYCLING.

Auto Cycle Club.

TO-DAY (Saturday) the open hill climb of the club takes place in the grounds of Blackdown House, Fernhurst, near Haslemere, a stretch of hill in these grounds having been placed at the disposal of the club by Mr. F. S. Philipson-Stowe. The length of this now well-known hill is about one mile, with an average gradient of 1 in 11, 380 yards of which is 1 in 8, and about 250 yards 1 in 4½. As already announced, provision is made in the seven classes for all types of motor cycles.

Auto Cycle Club Quarterly Trial.

NON-STOP certificates to the following machines, which competed in the second quarterly trial, held on April 25th last, have been awarded :—

Bicycles.—3½-h.p. Brown, 3-h.p. Triumph, 3½-h.p. Clyde, 4-h.p. Werner, 3¼-h.p. Rex, 3½-h.p. Quadrant, 4-h.p. Werner.

Tricars.—10-h.p. Invicta, 9-h.p. Riley, 9-h.p. Singer, 6-h.p. Riley, 10-h.p. Lagonda, 9-h.p. Riley.

150 Miles "Non-Stop" Run.

IN reference to the 150 miles "non-stop" reliability trial of the Essex Motor Club for motor cycles, particulars of which we gave last week, the following are the official results :—

Motor Cycles.—1. F. Hulbert, 3-h.p. Triumph. 2. F. Appleby, 3¼-h.p. Rex.

No tricar completed the course, B. Holland, on the 9-h.p. Singer, having a burst tyre, and F. Cozens, on the 10-h.p. Lagonda, having an accident with his chain.

1,600 Kiloms. Trial for Motor Cycles.

UNDER the auspices of the Austrian Motor Cycle Club, starting from Frankfort-on-Main on June 6th, a long distance trial over 1,600 kiloms. is to be run off. The chief points visited on subsequent days will be June 7th, Munich ; 8th, Linz ; 9th and 10th, Vienna ; 11th, Klagenfurt ; 12th, Innsbruck ; 13th, Förstenriederpark.

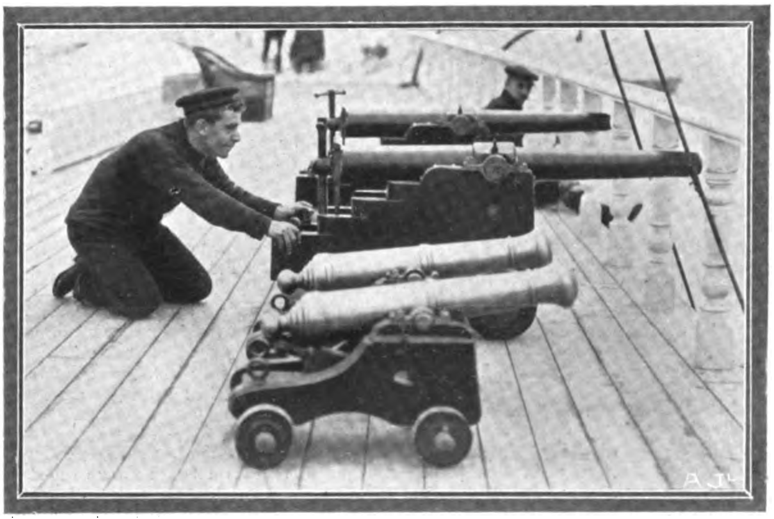
The Competition Medal of the Midland A.C. — This medal has been awarded Mr. Cecil Edge, in the Club's Petrol Consumption Competition at Birmingham, for his 18-h.p. 4-cylinder Napier, which averaged 30·59 miles per gallon, with four passengers up. Total weight, 29 cwt. 7 lbs.

Motor 'Bus Cases in the London Police Courts.

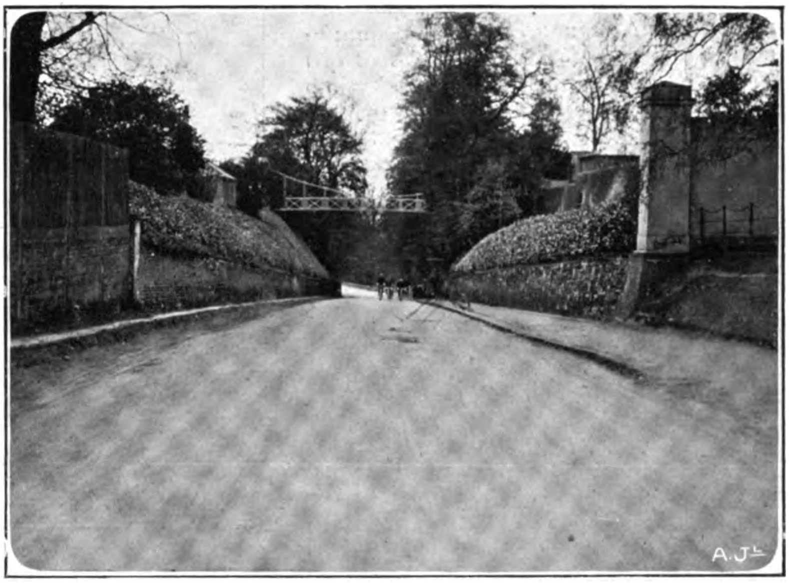
Several motor 'bus cases have engaged the attention of London magistrates during the past week. In one of these cases the charge was against a driver in the employment of the London Road Car Company for exceeding the legal limit of 12 miles an hour in the Bow Road. The usual defence that the 'bus was physically unable to exceed that pace was set up, but was not allowed by the magistrate, and the result was a conviction with a fine of *20s.* and *23s.* costs. Another driver, in the employment of the Great Eastern London Motor Omnibus Company was also convicted on the same charge, and fined *5s.* and *23s.* costs. Another driver was summoned at the South Western Police Court for not stopping his machinery when the 'bus was standing still, so as to prevent noise, and also for not taking due precautions against its being started in his absence. After carefully considering the case, Mr. De Grey stated that the driver was of course bound to take due precautions, but that he did not know precisely what this meant. It might mean that he should take every possible precaution, or it might mean merely that he should take reasonable precautions. The latter, in his opinion, the driver had done, and he therefore dismissed the summons. With regard to the noise, he considered that the case had been made out, and imposed a nominal penalty of *2s. 6d.* with *2s.* costs.

Motor Car Cottages.

The way in which the automobile is unexpectedly conferring an increased value on various kinds of property is illustrated by the case of Lord Cadogan's cottages at Chelsea, which were built early in the last century, but have never been inhabited, as they were condemned as unfit for letting. By removing the joists, and providing each cottage with a pit, they have now been converted into useful motor car houses.



The "Enchantress" battery on the main deck. Prepared for action.



Scene of the Police Motor Trap on Doynes Hill, Cobham, located by the A.A. Scouts, and photographed by the Chairman, Col. W. J. Bosworth. A policeman is stationed on the suspension bridge, whence he commands a fine stretch of road.

Motor 'Buses for Edinburgh?

The Edinburgh Corporation is promoting a Bill, which has just come before Parliament, in which they have deleted all proposals to construct extensions of the tramway system outside the city on account of the great expense that would be involved in street and bridge widening. The Corporation have under consideration an alternative scheme for the inauguration of a motor omnibus service between Fountainbridge and Slateford, to be organised by a private company. In connection with this venture, it is proposed to relay the surface of the streets with some smooth surface for the convenience of the motor 'buses.

Horseflesh as Dear as Ever.

In spite of the large number of horses that must necessarily have been replaced by motors quite recently, the curious fact emerges that the price of horses is not only as high as ever it was, but is even somewhat higher. At least, this is what was stated in evidence in a recent County Court case, in which a witness, evidently well acquainted with the trade, maintained that purchasers now had to pay as much as £45 for horses of the same calibre as they could some years ago have procured for £35. It is not easy to say at once what the complete explanation of the phenomenon is. Probably it is partly to be found in the fact that a proportion of the motor vehicles are being used by people who did not previously employ the horse. Another cause, and probably a more powerful one, is that farmers and other horse breeders became unnecessarily frightened when the motor car came in, and, in consequence, have abandoned breeding and importing horses to such an extent as to over-compensate for what would otherwise have been the natural drop in price.

A ROYAL CAR.—The 10-14-h.p. 4-cylinder Renault Landaulette, which has been sold to H.M. the King.

Beware!

A CORRESPONDENT writing from Bedford gives the following valuable information *re* traps :—

"The Hunts police are very active on the North Road; they are working the old trap in the village of Buckden, and also a trap at the hamlet of Alconbury Weston, between 67 and 68 miles from London, in the Contour Road Book, Route 525. In the last-mentioned trap the police stand round the corner about 100 yards south of the village of Alconbury Weston, from where they can see cars coming down Alconbury Hill, across the bend the road makes there; the measured 620 yards is taken from a telegraph post on Alconbury Hill to the corner of the road south of the village. The traps seem to be worked principally on cars going south, as they are then going down hill.

"In my opinion, however, motorists, however carefully they drive, are not safe from police traps on the North Road, from Norman Cross going south to the borders of Hunts. I advise them for the present, if they must go in that direction, to leave the North Road at Eaton Socon, and work round by Kimbolton, joining the North Road again north of Oundle.

"I was stopped by the police at Alconbury Weston last Monday."

An Important Convert.

SWITZERLAND has for a long time past been highly inhospitable to the automobile, and it is therefore satisfactory to learn that the President of the Republic has recently been converted by M. Ernest Cuenod to the cause of automobilism. M. Cuenod took the President in his car to the opening of the Geneva Exhibition, and induced him to take an interest in the various stands. The result was that at the subsequent banquet the President promised the assistance of the Federal authorities in mitigating the anti-automobilist policy of district officials.

Motor Cars Preferred to Light Railways.

THE capacities of the automobile for dealing with cross-country traffic have proved themselves so satisfactory in Bavaria, that we understand that in that country the further development of light railways is to be discontinued, and trade and intercourse between the various villages carried on by motor car services.

A Motoring Sweep.

To the Essex sweeps belongs the honour, we believe, of being the first to adapt the motor car to their ancient profession. It is reported that a firm of chimney cleansers in that county are now making use of a small motor car to assist them in performing their professional rounds.

International Congress of Automobilism at Milan.

NEXT week this important Congress at Milan commences on May 24th, and lasts five days. The following discussions are the more important subjects which will be dealt with :—

SECTION I.—*Technical and Road Questions.*

"Electric Vehicles — Motors and Transmissions": By Charles Jeantaud.

"Steam Vehicles": By Léon Serpollet.

"Internal Combustion Motors—Advances made, present state of the industry, and the advances at which makers should specially aim": By Cav. Giovanni Enrico.

"Transmissions in Petrol Vehicles": By Alberto Balocco.

"Chassis and Carriage Work": By Georges Kellner, President of the Coach Builders' Society in Paris.

"Spring Wheels": By Leonce Ferrus, Commander of the 13th French Artillery at Vincennes.

"Pneumatic and other Rubber Tyres for Automobiles": By Dott. Alberto Pirelli, pneumatic tyre manufacturer in Milan.

"Construction of Roads in Regard to Automobile Traction": By Prof. Massimo Tedeschi.

SECTION II.—*Economic Questions.*

"Comparison Between the Different Systems of Automobile Traction (steam, petrol, electricity, &c.)": By Ugo Baldini.

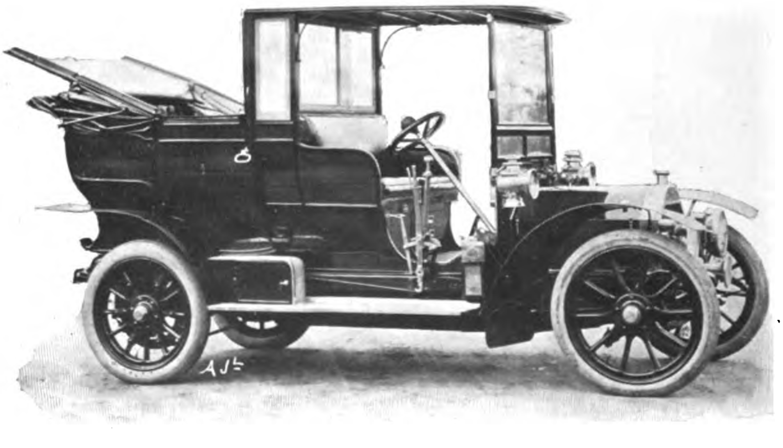
"Public Services with Automobiles (omnibuses, hackney carriages, &c.)": By G. H. Baillie.

"Economic and Fiscal Aspects of Automobilism": By Hon. Avv. Prof. Angelo Majorana, Deputy, ex-Minister.

SECTIONS III. AND IV.—*Questions of Legislation and Custom Duties.*

"Comparison of the Legislation and Regulations Respecting Automobile Traffic in Different Countries. The Possibility of Uniformity": By Avv. Cesare Gatti-Goria.

"Regulations Respecting the Passage of Automobiles from one country into another": By Colard Ettore, Principal of the Automobile Service of the T.C.B.



A 20-25-h.p., 1906 Model, "Brotherhood" Landaulette built for the Rt. Hon. the Marquis of Zetland.

COMMERCIAL POINTS.

Motor Spirit for Whitsun.

The increased number of motor vehicles of various descriptions which are daily being put on the road must naturally increase the demand for petrol to an enormous extent, and during the coming Whitsuntide holidays, provided the weather compares favourably with that of Easter, there will be a similarly heavy demand on all the local supplies. In anticipation of this, the Anglo-American Oil Company will arrange to have an adequate supply of their Pratt's Motor Spirit distributed throughout the United Kingdom.

A Convenience for Motorists.

On Saturday afternoons and all day Sundays, spare covers and tyres, we are advised by the Motor Tyre and Non-Skid Factor, of 169, Shaftesbury Avenue, can be obtained from them in an emergency.

The engines for the "Ariel-Simplex" cars are, in future, to have their cylinders cast in pairs, instead of having all four (or all six) formed by a single casting as hitherto.

The Nizam of Hyderabad has placed an order with the Daimler Motor Company for one of their cars for State purposes.

How best to dispose of his old car is often a puzzling problem for the motorist. Perhaps the following testimony on the part of Mr. Max Pemberton, the well-known author and enthusiastic motorist, may help some of our readers to solve the difficulty:—

"'Heathcote,' 56, Fitzjohn Avenue, Hampstead, May 7th, 1906. The Motor House, Euston Road, N.W. Dear Sirs,—I shall be delighted for you to use my name as a reference. I am most satisfied with your promptness and dispatch and your admirable methods of doing business.—Yours faithfully, Max Pemberton."

The Automobile Association patrols are now attending special classes of instruction in tyre repairs, by courtesy of Messrs. Harvey Frost, and Co. ; the Continental Tyre Co. ; and Messrs. R. and J. Pullman, of Godalming. Similar arrangements are being made with the Dunlop Tyre Company.

The General Petroleum Company, Limited, 19–21, Billiter Street, E.C., proprietors of the Shell Motor Spirit, ask us to refute a statement that has been circulated to the effect that their Company has been absorbed by the Standard Oil Company.

The motor industry is developing at Peterborough, and one or two large engineering firms, recently established in consequence of the fact that exceptional railway facilities are afforded, that rates are low, and that there is plenty of land available near five main lines, are busy manufacturing motor 'buses and cars. Messrs. Thos. Brainsby and Sons, also of Long Acre, London, an old-established firm of coach-builders, have taken a lead in the manufacture of motor bodies for the principal firms and notabilities of the day. They employ a large number of skilled workmen, and their work is despatched to all parts of the kingdom and the Continent. Mr. G. C. W. Fitzwilliam, of Milton Park, predicted at a notable public gathering that Peterborough would soon become one of the most important centres of industry in the Midlands. His prediction is being realised, and the industry at Peterborough now gives employment to a large number of hands. It is a great motoring centre, and at Stamford, close by, the well-known George Hotel has been secured as a route hotel. The Marquis of Exeter and Mr. Leonard Brassey, of Aplethorpe Park, both enthusiastic motorists, reside in the neighbourhood.

Messrs. W. Weeks and Son, Ltd., inform us that they are opening premises on the main road, Maidstone, to be known as the "Maidstone Motor Garage." A stock of spares will be carried, and repairs quickly done by proficient motor engineers. Inspection pits are provided.

* * *

Electric Goods Vans.

At Slough the Great Western Railway Company have been experimenting with an electrically-propelled goods van. It is intended to utilise this in dealing more expeditiously with the delivery of perishable consignments arriving by goods train. About two tons of light goods can be accommodated in the body of the vehicle.

Scottish Motor Show.

Already official announcement is made that this show is to take place at Waverley Market, Edinburgh, from March 15th to 23rd, 1907.

Arrival in Heddon Street of a consignment of thirty 10-h.p. Cadillac cars, last week.

CORRESPONDENCE.

Re THE LONDON ELECTROBUS COMPANY, LIMITED.

To the Editor of The Automotor Journal.

Sir,—We beg to state that upon motions made to-day for the section of allottees for whom we act, Mr. Justice Swinfen Eady ordered that the register of members of this company be rectified by removing therefrom the names of our clients as shareholders of the company on the ground of misrepresentation and suppression or non-disclosure of material facts in the prospectus of the company, and that the company do pay to our said clients the sums paid in respect of the shares allotted to them respectively, with proper interest and the taxed costs of the applications. We think it desirable that the terms of this order should be made known through your wide circulation.

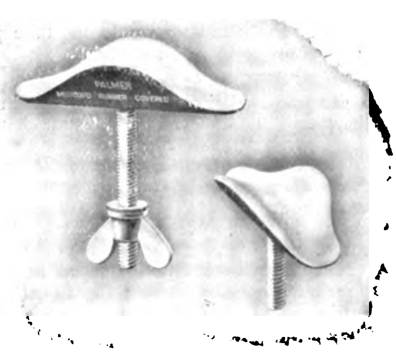
Thanking you for the assistance which you have rendered to our clients in the matter by your timely criticisms of the prospectus,

We remain, Sir,
Your obedient servants,
May 11th, 1906. Michael Abrahams, Sons and Co.

* * *

Palmer Security Bolt.

With the object of overcoming the tendency to "cockle," which is so prominent a characteristic of the ordinary canvas tab on the security bolts, the Palmer Tyre Company have adopted a moulded rubber head for their bolts. This rubber, which has a fabric surface, is flexible, but also resilient, so that it tends to keep its proper shape. The steel head of the bolt itself is entirely embedded in the rubber so that the surface is quite smooth both back and front.



LAW REPORTS.

London Electrobus Co., Ltd.

IN the Chancery Division on May 11th, several applications in the matter of this company were made.

Before Mr. Justice Swinfen Eady, Mr. Eve, K.C., submitted a motion to rectify the register of the company by removing the names of several applicants, who, he said, had been induced to apply for shares by a prospectus which was inaccurate and omitted certain material facts.

Mr. Colefax, for the company, said that the directors recognised that some of the statements in the prospectus required qualification and some amplification, and they were getting together the further information, which would be embodied in a circular and sent to the shareholders, who would be given an opportunity, if so minded, of claiming to withdraw, which would then be acceded to. He thought this should meet the views of Mr. Eve's clients, and if the motion was allowed to stand over for a week he would give an undertaking not to part with the moneys of the company in the meantime. Counsel added that the company had not begun business and did not propose to acquire the certificate entitling it to do so until these matters were disposed of. The money was all intact.

Mr. Justice Swinfen Eady—But would it remain intact if the company went into liquidation? The applicants would then be unsecured creditors.

Mr. Eve said his clients had obtained all the information they wanted without the assistance of the directors, and did not require a week to consider the matter.

Mr. Colefax submitted that it would be better to let the motion stand over until all the shareholders had been circularised.

Mr. Justice Swinfen Eady said it was quite immaterial to the applicants what the other shareholders did. If they wished to leave the company they were entitled to do so.

Mr. Eve said that one of his clients sent an application form, and the next morning, seeing something in the Press, he wrote withdrawing it. *He received in the same envelope the allotment form and a note that it had been sent before his letter of withdrawal had been received.*

Mr. Colefax admitted that cases of that kind stood on a different footing.

Mr. Justice Swinfen Eady—Unless you can agree I must dispose of the motion.

Mr. Colefax said that if Mr. Eve persisted he could not resist the order asked for.

Mr. Justice Swinfen Eady—The order must go as regards these applicants. Their money must be returned, and the company will pay the costs of this motion.

A motion in the action "Byrne and others *v.* the same company" was mentioned to Mr. Justice Joyce by Mr. Hughes, K.C., who asked that the company should be restrained until the trial of the action or further order from parting with the moneys paid by the plaintiffs on application for shares. Counsel stated that he understood from the correspondence that the company were prepared to give an undertaking that, pending further proceedings, they would not part with the money paid by the applicants for shares, and would not take any step to forfeit their shares pending the trial.

Mr. Colefax, for the company, made a statement similar to that made by him before Mr. Justice Swinfen Eady The application moneys, he said, were intact, and there were a great number of people desirous of sticking to the company. He would give an undertaking not to part with any moneys except to shareholders applying on the form which would accompany the circular.

His Lordship—Nor until further notice without reserving these sums, unless seven days' notice was given.

Mr. Colefax agreed, and said the company would not take proceedings to forfeit shares for non-payment of instalments.

Messrs. Simmons and Simmons, solicitors for the plaintiffs in the case of "Byrne and others *v.* the same company," state that the following undertaking was given by the defendant company on the application by Mr. E. W. Martelli at the hearing of the motion before Mr. Justice Buckley: The motion to stand over for a week, the company undertaking not to part with the moneys of the company in the meantime, except to shareholders, in repayment of the amount paid by them, nor without keeping enough to answer the plaintiff's claim, without seven days' notice, and undertaking not to forfeit moneys paid in the meantime; the undertaking to extend to all clients of Messrs. Simmons and Simmons, a list of such clients to be given that day to the respondents' solicitor.

Another motion for rectification of the London Electrobus Company's register was brought by Dr. Campbell, who applied for 300 ordinary shares. It was not disputed that the letter of withdrawal was received by the company before the allotment, and his Lordship made an order for rectification.

Rapid Transit Co. *v.* Wright and others.

MR. JUSTICE JOYCE on May 11th heard a motion by the Rapid Transit Company to restrain Mr. Tindal Wright, Mr. Sewart, and Mr. Underwood from continuing to act as directors without being properly qualified. Mr. Ford (for Mr. Underwood) gave an undertaking in the terms of the notice of motion until trial. Mr. Colefax (for the company) said that the other directors had never qualified, although elected directors in November last. Mr. Sewart had filed an affidavit, in which he said he had a claim on certain shares now standing in the name of a Dr. Lehwess. The company, however, denied that, and said the defendant, even if he had such a claim and succeeded, would still be miles off becoming a director, as he would have to be re-elected. Mr. Ashton Cross, on behalf of Mr. Sewart and Mr. Wright, admitted they were not qualified; but said they could not get the shares from the only persons who could give them. His Lordship granted an injunction until the trial of the action against Mr. Wright and Mr. Sewart.

* * * *

COMPANY DOINGS.

A. Darracq and Co. (1905) (Ltd.).

LAST week an Extraordinary General Meeting of the shareholders of the Company was held, when Mr. J. Smith-Winby, the Chairman of the Company, presided.

The sole object of the meeting was to obtain confirmation of a provisional agreement between M. Léon Serpollet and the Company, in connection with the exploitation of the well-known Serpollet system of steam motor vehicles. Mr. Smith-Winby, in explaining the proposed arrangements to the shareholders, reminded them of his remarks in February last, at the Statutory Meeting of the Company, when he foreshadowed important departures in the department of motors for heavy traction. He was not able to give any definite details then, as negotiations were still in progress, but M. Darracq had before then and since been carefully studying the whole question for some time, and he told them in February that M. Darracq was distinctly of the opinion that the truly practical and efficient type of motor omnibus had yet to be evolved, and that until he was satisfied that he had solved the problem in a manner which would produce more permanently satisfactory results to buyers and users of these vehicles than had been hitherto accomplished, he would not advise the Company to embark on this serious branch of manufacture. M. Darracq had not, he need hardly say, been inactive all the time since February. The demand for self-propelled vehicles for heavy weights was very great, and had been proved throughout the whole world, but the trouble was to produce and develop the right type. M. Darracq had inspected and examined all the best existing types of petrol 'buses, and he had come to the conclusion that it was not worth while building vehicles of this character, as the result would not, in his judgment, be permanently satisfactory. It was a totally different problem to the manufacture of a light pleasure or racing car, cab, or delivery van, and the whole difficulty arose from the increase of weight and from the excessive shock and strain which inevitably arise from the necessity of starting and stopping, re-starting and re-stopping, these ponderous vehicles on roads of all descriptions. M. Darracq was emphatically of opinion that no system of gears and transmission which had yet been devised was capable of resisting the strain which the petrol omnibus with a complement of 34 passengers, or a heavy five-ton petrol lurry, was called upon to meet in everyday use. In other words, the internal combustion, or petrol, motor for the purposes of heavy traction was not, in the light of present knowledge, a really practical and satisfactory engineering proposition. That was M. Darracq's deliberate judgment.

The chairman, continuing, said that electricity, for motor 'buses, might be dismissed as outside the regions of practical politics, until Mr. Edison or some other inventive genius produced the storage battery that had been heard about from time to time during the last ten years. Steam only remained for them to consider, and it was to M. Serpollet therefore that they at once turned, and with him they entered into a treaty which he thought combined the inventive genius and scientific knowledge of M. Serpollet with the unique genius of M. Darracq, as a manufacturer and factory organiser, backed up with ample facilities and working capital. Their negotiations eventuated in the arrangement which after careful investigation was being submitted to the shareholders for confirmation that day. M. Serpollet had convinced the directors that his laboratory and testing stages were over, and that his work now stands ready for the factory. Already he had a number of his steam omnibuses running successfully on the Continent and the Darracq directors were thereby enabled to obtain information of their behaviour, the result of which was most gratifying.

At Easter last M. Darracq was taking a holiday at Nice, and devoted a good deal of his time to examining into the performances of two Serpollet omnibuses which had been running for the last eighteen months from Nice to Mentone, over the Corniche Road, and back. At the end of the season last year, after a daily service over this most arduous route, these two 'buses were taken by road from Nice to the Pyrenees, where they ran during the months of July, August, and September, and in October they returned to Nice, where they had been running again all the winter. They at this moment were returning by road to the Pyrenees; so that they would see the work they had been and were doing was of the most severe description. M. Darracq examined these two omnibuses, and interviewed the proprietor. Seeing the excellent condition in which he found them, he asked how much had been spent in up-keep and repairs. The proprietor made the astonishing statement that during the whole time that he had had these omnibuses he had not spent one single centime in repairs; that apart from lubrication, he had done nothing to them since he had received them from M. Serpollet, eighteen months ago, and that the only renewals that had been necessary were the tyres. As regards the cost of tyres, also, he said that, having had personal experience of both kinds of motor omnibuses, the advantage was unquestionably in favour of the steam omnibuses, on account of their smoothness in moving off and running, even on the steepest hills.

These omnibuses, the chairman continued, however, were not the latest type of M. Serpollet's production, nor the type which they were really pinning their faith to. Theirs was a more powerful machine giving over 40 h.p., and containing various improvements which M. Serpollet had only perfected quite recently, and superior in many points of detail even to the admirable work which he had already produced. One of these new types had recently been tried on the famous Mont Valerien in Paris, fully laden with passengers, with very remarkable results. Two of these chassis were now in course of having bodies fitted, and were expected to be delivered in London early next month, when they would be subjected to trials of a most exacting character. Unless M. Darracq and all other authorities they had consulted were mistaken, these tests would demonstrate that at last this most difficult problem of motor omnibuses had been satisfactorily solved. Col. R. E. Crompton had quite recently examined one of the latest types of M. Serpollet's steam 'buses, and he had given a remarkably satisfactory report. In fact, Col. Crompton congratulated the company upon having secured the rights for such a very excellent type of vehicle, which, in his opinion, would revolutionise the motor omnibus question.

The chairman said there also appeared to be great advantages in the Serpollet system as applied to marine purposes. In regard to the arrangements for manufacture, he stated M. Serpollet's present works would be utilised for the time being, but later on a large factory would be established and equipped with the latest machinery and plant at Suresnes, on land adjoining the Darracq Company's works, this new factory being designed and organised by M. Darracq personally, in conjunction with M. Serpollet.

The proposal which he had to submit for the shareholders' approval was that a company should be formed called the Darracq-Serpollet Omnibus Company, Limited, with a capital of £500,000, of which £200,000 would represent working capital and consist of preferred ordinary shares. The other £300,000, consisting of ordinary shares, would be divided equally between the Darracq Company and M. Serpollet, the latter contributing his present business, works, machinery, assets, and patents, and the Darracq Company contributing its name. The preferred shares it was proposed to issue at the small premium of 1*s.* per share, in order to provide for the whole of the expense connected with the formation of the company and the transfer of the properties. They did not propose to issue any prospectus in regard to these shares, so as to avoid the many irksome formalities of the Companies Acts. For this reason he had very carefully explained the whole position clearly to the shareholders, and although no prospectus was to be issued, shareholders desirous of participating in finding the capital could be provided with a form of application by the secretary. In the allotment of these shares priority, he thought, should be given to the present ordinary shareholders of the Darracq Company.

A shareholder suggested that he thought it would be more equitable that all classes of shareholders should be allowed to participate in the new issue.

Sir William Avery seconded the carrying of the formal resolution for adopting the provisional agreement with M. Serpollet, which was unanimously carried.

John I. Thornycroft and Co. (Ltd.).

THE directors' report just issued shows a trading profit of £35,502, and after allowing for depreciation, directors' fees, debenture interest, and preference dividend, a balance remains to be carried forward to next year's revenue account of £2,295. In their report, the directors state that, recognising the great possibilities in connection with gas-producer plants as applied to marine propulsion, they have taken up a licence to manufacture the Capitaine Marine Gas Plant in conjunction with Messrs. William Beardmore and Co., Limited. A large sum has been spent on experiments in connection with this plant.

The motor vehicle sales, which have shown a considerable increase, have included a number of motor omnibuses which have not given profitable results, owing to the large sum spent in experimental work, the whole of which has been written off. The Board believe, as the result of these experiments, they have produced a satisfactory vehicle.

NEW ISSUE.

Anglo-French Herald Motor Company, Limited.

WITH a capital of £120,000 divided into £1 shares, on Monday last an issue of £75,000 in this company was made. The Company has been formed to acquire the motor manufacturing business of the Société Hérald, &c., of Paris. Two valuations of the assets have been made, one by Frederick R. Goodwin, giving the value as £62,500, and the other by MM. L. Bodard and B. Marinovitch, of £60,000. The estimated amount of sales for the year are given as £120,000, expenditure thereon £90,000, leaving gross profit £30,000, off which general expenses of £8,000 leave a net estimated balance of £22,000 for the year's working. It is mentioned that 20 Herald motor cabs are at the present time in London. The purchase price is £67,000, payable as to £45,000 in fully paid shares, and £22,000 in cash, part cash, or fully paid shares, at the option of the directors. The stock-in-trade is to be paid for beyond this by valuation. The preliminary expenses are estimated at £4,500. For this Messrs. Hamon and Company receive the sum of £5,000, and in addition £5,300 is payable for the underwriting of £53,000 of the capital. The business of the Société Hérald, which the company proposes to acquire, was purchased by Messrs. Hamon and Company for £38,000, payable in shares of this new company.

NEW COMPANIES REGISTERED.

Anglo-French Herald Motor Co. (Ltd.), 2, Coleman Street, E.C.—Capital, £120,000 in £1 shares. Directors, Sir Thomas Devereaux Pile, Bart., Sir Richard Carnac Temple, Bart., Reginald Lassen, Le Baron de la Grange Otard, M. Robert Dupuy D'Angeac, M. Fernand Outrey, M. Raoul Racine.

Argylls, Ireland (Ltd.), 102, Grafton Street, Dublin.—Capital, £6,000 in £1 shares.

Auto Syndicate (Ltd), 30 Moorgate Street, E.C.—Capital, £10,000 in £1 shares. Object, to acquire patent rights known as "Auto-Mixte" (System Pieper).

Clyde Motor Boat Company (Ltd), 48, West Regent Street, Glasgow.—Capital, £1,500 in £1 shares.

Cox-Walkers (Ltd.).—Capital, £10,000, in £1 shares. Objects, to acquire the business carried on as Cox-Walkers and Cox-Walker and Sons, of electrical, automobile and general engineers.

Eastern Omnibus Passenger Trust (Ltd.).—Capital, £1,000 in £1 shares. Objects, to carry on the business of motor omnibus proprietors, &c.

Hastings and St. Leonards Motor Car Co. (Ltd.), 289, London Road, St. Leonards-on-Sea.—Capital, £2,000 in £1 shares.

Mail Motor Co. (Ltd.).—Capital £1,250, in £1 shares. Objects, to carry on in Grimsby and Caistor, Lincs., the business of carriers of passengers and goods, constructors and proprietors of automobiles, motor boats. First directors, G. H. Martyn, J. W. Eason, and W. H. Wintringham.

Mildmay Motor and Cycle Stores (Ltd).—Capital, £500 in £1 shares. Objects, to acquire the business carried on by S. C. Stevens at 80a, Newington Road, N., as the "Mildmay Motor and Cycle Stores."

Motor Car Coppersmithing and Appliances Co. (Ltd.), 172-176, King's Cross Road, London.—Capital, £2,000 in £1 shares. Object, to take over the business of motor car manufacturers, coppersmiths, and makers of motor accessories and appliances, lately carried on at 172-176, King's Cross Road, London, in agreement with L. Leroi, M. Domenech, T. W. Smyth, and J. W. Bainbridge.

Motor Investments (**Ltd.**).—Capital, £5,000 in £1 shares. Objects as indicated by the title.

Motor Mail Transport Syndicate (**Ltd.**). — Capital, £5.000 in £1 shares.

New Speedwell Motor Co. (**Ltd.**).—Capital, £50,000 in £1 shares (10,000 5 per cent. cumulative preference). Objects, to acquire the business carried on bv the Speedwell Motor and Engineering Co., Ltd., at 151, Knightsbridge, S.W., and at Chiswick, W. First directors, M. L. Braithwaite, H. W. Howe, C. H. Dodd, A. J. Dew (managing director), and J. W. H. Dew (works manager).

Northern Garage (**Ltd.**).—Capital, £3,000 in £1 shares. Object, to manufacture and store motor cars, &c. First directors, W. Hardy and T. Wanless.

Nottingham Electrobus Co. (**Ltd.**).—Capital £100 in £1 shares. Objects, same as in Manchester Electrobus Co., Ltd. (*q.v.*).

Provincial Electrobus Co. (**Ltd.**)—Capital, £100 in £1 shares. Objects, same as in Manchester Electrobus Co., Ltd. (*q.v.*).

Ryknield Motor Co. (**Ltd**), Ryknield Works, Burton-on-Trent.—Capital, £30,000 in £1 shares. Object, to acquire the business of the Ryknield Engine Co., Ltd.

St. Vincent Motor and Cycle Co. (**Ltd.**).—Capital, £20,000 in £1 shares. Object, to acquire the business of William M'Lean, motor and cycle manufacturer, Glasgow.

Tenax Tyre and Rubber Manufacturing Co. (**Ltd.**).—Capital, £500 in 475 preference shares of £1 each, and 500 ordinary shares of 1*s.* each.

Triumph Engineering Co. (**Ltd.**).—Capital, £100 in £1 shares. Object, to carry on the business of engineers, manufacturers of motors, motor cars, &c.

Triumph Motor Co. (**Ltd.**).—Capital, £100 in £1 shares. Object, to carry on the business of manufacturers of motors, motor cars, &c.

Woking and District Motor 'Bus Co. (**Ltd.**), Bank Chambers, Woking, Surrey.—Capital, £3,000 in £1 shares. Objects, to adopt an agreement with H. Quartermaine, R. Paine, R. A. Colman, W. Mallard, W. J. Boullin, T. Pook, E. S. Sellabank, M. J. Allen, J. Davis, M. H. Westgate, W. Ireland, E. Bond, E. Bissell, W. J. Collinson, A. Pocock, T. Previtt, and C. Duplock, and to carry on the business indicated by the title. First directors, S. C. Knight (chairman), E. B. A. Allen, J. Archibald, W. J. Butt, A. E. Harrison, H. A. Whitburn, and A. R. H. Wright.

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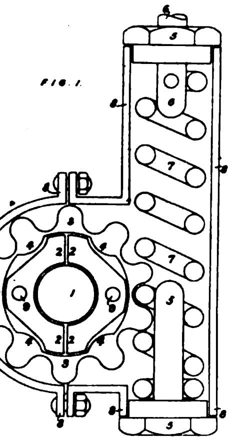
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

11360. 31st May, 1905. Improvements in or relating to Driving Mechanism for use in conjunction with Mechanically-Propelled Vehicles. John Beech, 6, Springs Terrace, Ilkley, Yorkshire. This invention relates to a spiral spring-drive acting as a worm-drive and forming a flexible means of communication from the engine or engines to the driving-wheel or wheels in such a manner that the engine or engines can make one or more revolutions before the vehicle moves. The energy is absorbed by the flexible drive until the resistance of the vehicle is overcome, and the vehicle moves in response to the engine without shock or strain to driving or driven mechanism. The spiral spring worm-drive, when rotated by the engine, actuates a sprocket-wheel situated on the hub-axle or other part of each driving-wheel. Each sprocket-wheel contains and actuates an automatic clutch in such a manner that the clutch engages with the driving-wheel or axle, and communicates the energy from the engine to the driving-wheels by means of the spiral spring worm drive and sprocket-wheel, so long as their speed exceeds that of the driving-wheel to which they are attached. When from any cause, such as going round a curve, it is necessary that one side driving-wheels should travel faster than the others, the engine will remain in connection with the inside or slowest revolving wheels, and the outside or fastest wheels will automatically disengage from the engine by means of the automatic-clutch, thus performing the duties of the usual differential-gear as applied to mechanically-propelled road-vehicles. There are three figures. Fig. 1 is a side elevation showing the general arrangement of the invention. 1 is the driving-hub or axle. 2 are the automatic clutch-blocks pivoted on pins, 9. 3 is a sprocket-wheel fixed on each driving-hub or axle, and contains the automatic clutch-blocks which are spaced and held in position by pins, 9, the latter being supported by washers, into which each end of the pins, 9, is secured by collars fixed to the hub or axle, 1. 4 are internal projections inside the sprocket-wheel, which, when the sprocket-wheel is rotated by the spiral spring worm-drive, act upon one half of each clutch-block, pressing it on the driving-hub or axle, and connecting engine to driving-wheel. As the sprocket-wheel cannot drive the engine by means of the spiral spring worm-drive, the provision of an automatic-clutch prevents damage to worm-drive when a driving-wheel runs the engine, or the engine is stopped while the vehicle is moving. 5 are nuts and pins, acting as footstep-bearings for spiral spring worm-drive, and making oil-tight joints with casing, 8. 6 is a driving-shaft actuating worm-drive, 7, forming when rotated by the engine a flexible worm-drive between the engine and the sprocket-wheel by means of the contraction and expansion in length and diameter of the spiral spring according to the thrust or pull caused by the load resistance. 8 is a case forming an oil bath, and prevents undue expansion in the diameter of the spiral spring worm-drive.—April 25th, 1906.

FIG. 1.



19279. 23rd September, 1905. Improved Means for Use in Starting Multiple Cylinder and Double-acting Cylinder Internal Combustion Engines. The Wolseley Tool and Motor Car Company, Limited, and Alfred A. Remington, both of Adderley Park, Birmingham. This invention relates to the use of explosive cartridges for starting internal-combustion engines, and consists in the utilisation of such cartridges, in starting multiple-cylinder and double-acting-cylinder internal-combustion engines, by firing a cartridge in respect of one of the cylinders, or in respect of one end of a double-acting-cylinder, by hand, and utilising the resulting momentum to fire automatically a second cartridge, which is used in connection with a cylinder of which the cycle follows that of the cylinder of which the cartridge is fired by hand. There are six figures. Fig. 1 is a section of the apparatus. A cartridge-chamber, A, in which a cartridge, B, is shown, is let into and fixed against the back or breech end, C, of the cylinder. The inner end, *a*, of the chamber, A, is open to the interior of the cylinder. A breech-block, D, is pivoted by a pin, *d*, to the lower portion of the back end of the cartridge-chamber, so that it may be turned down from its closed position into its open position, indicated by broken lines. The breech-block, D, may be fastened by a nut, *b*, screwed on to a stud, b^1, which is tightly screwed into an ear of the cartridge-chamber, and passes through a hole through a flange, *c*, of the breech-block, which runs out through the edge of the flange to allow the block to be turned down. To expedite the screwing up and unscrewing of the nut, *b*, it is formed with a shank, b^2, and eye, b^3, through the latter of which is passed a vice-handle, *e*. An extractor, E, for ejecting an empty cartridge-case is of the usual character, and is let flush with the back face of the cartridge-chamber, and has a common pivot axis with the breech-block, and a heel, *f*, against which the lower edge, f^1, of the breech-block strikes as the block is opened and thus operates the extractor. When the breech-block is in the position shown by broken lines, its lower edge, f^1, is against the heel, *f*, of the extractor, and the further movement of the block in the direction it has been moved in opening it, throws the extractor back and ejects the cartridge-case. The striker, F, is of the usual character, and consists of a rod, e^1, which passes along the axis of a chamber, F^1, formed in the breech-block, of a head, *g*, on the outer end of the rod, by which it may be pulled back, in setting the sear, of a spring, *h*, by which it is impelled suddenly forward when released, of a block, *j*, fixed round its inner end, which receives the thrust of the inner end of the spring, and is adapted for engagement with the sear, and of a pin, g^1, formed at the inner end of the rod, which strikes and thus fires the cartridge.—April 19th, 1906.

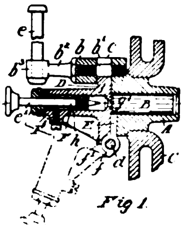


Fig 1.

Patent Specifications Published.

Applied for in 1905.

Published May 10th, 1906.

5,499. R and G. H. France. Silencers.
8,597. M. Halstead and F. C. F. Knaak. Explosion engines.
8,835. J., A., and A. Dykes. Attaching motor bedplates.
8,957. J. Muir. Shock absorbing appliance for wheels.
10,686. R. Hamilton and J. Marples. Transmission mechanism.
11,360. J. Beech. Driving mechanism.
12,537. K. Brignatz and G. Obrecht. Spring hub.
13,161. E. L. Robergel. Clutch device.
15,433. P. W. Noble. Brakes.
15,538. J. S. Switzer. Resilient solid tyre.
16,680. J. Dunlop and D. Stewart and Co. Ignition gear.
19,279. Wolseley Motor Car Co., and A. A. Remington. Means for starting engines.
24,293. W. Roos. Magneto-electric ignition apparatus.
25,172. Krieger and Co. Electric vehicles.
26,652. F. L. Morse. Chains.

Published May 17th, 1906.

8,522. W. Judd, A. Fraser, and A. R. Hadie. Speed indicators.
8,644. J. A. Wyssa. Motor cycles.
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16 960. A. W. Brightmore. Steam generators.
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24,585. W. G. Slipp. Tail lamps.
25,968. J. P. Fox. Starting device.

Applied for in 1906.

Published May 10th, 1906.

1,846. F. Lamplough. Filling cap for radiators and tanks.

Published May 17th, 1906.

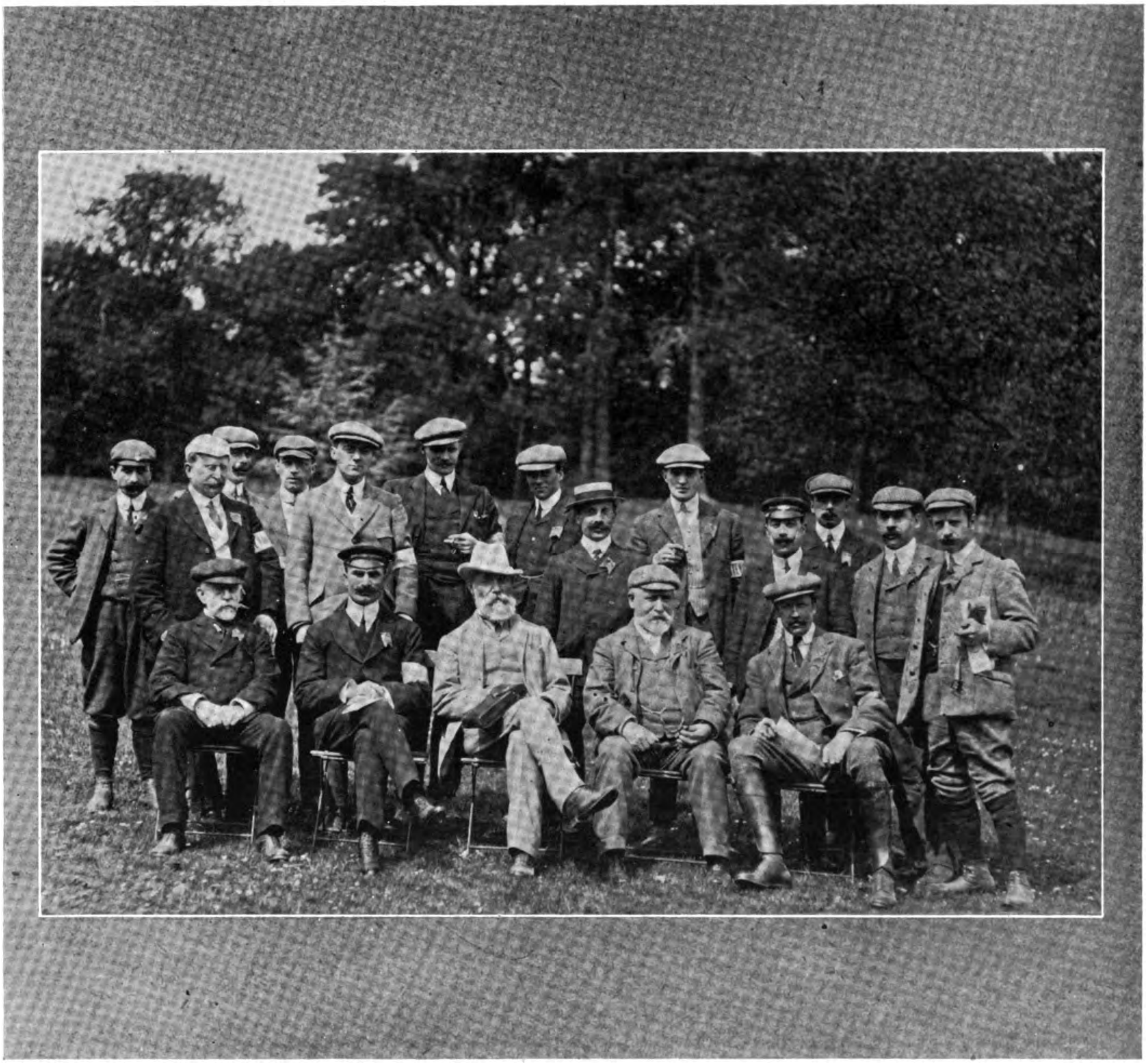
236. Soc. Anon. Mors. Steering mechanism.
1,507. F. R. Simms and R. Bosch. Magneto-electric ignition apparatus.
5,806. K. Petersen. Device for varying the speed of motors.

Automotor Journal, May 26th, 1906.

The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

No. 281 (No. 21, Vol. XI.) MAY 26TH, 1906. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.



AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST, NEAR HASLEMERE.—Last Saturday the Auto-Cycle Club were enabled to hold their annual hill climb in the grounds of Blackdown House, Fernhurst, the privilege being accorded the Club for this purpose, by Mr. F. S. Philipson-Stow. Sixty-eight entries were received, and the meeting was an extremely successful one. Above we are able to give a special group taken by "The Automotor Journal," including the host of the day, Mr. Philipson-Stow, who is seated in the centre of the front row, and the judges and other officials who took part in the meeting. On Mr. Stow's right hand are Mr. S. F. Edge (Marshal), and Mr. J. Lyons Sampson (Judge). On his left are Mr. Robert Todd (Judge) and Mr. J. W. Orde (Marshal). Back row, reading from left to right—E. W. Goslett, C. A. Smith, H. P. E. Harding, E. J. Linney, J. Thrupp, W. Craven, Q. O'Grogan, V. Hart, G. Todd, A. G. Reynolds, E. M. P. Boileau, A. V. Ebblewhite, and F. Straight, the Secretary of the Club, who was responsible for the arrangements.

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THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

British Events.

May 26 ...	Motor Union Meeting (Birmingham).
May 26 ...	Petrol Consumption Trials (Wolverhampton A.C.).
June 9 ...	Hill-Climb (S. Herts A.C.).
June 11-16 ...	Land's End to John O'Groat's (Auto Cycle Club).
June 13-16 ...	Scottish Reliability Trial.
June 13-16 ...	Irish Reliability Trials (Irish A.C.).
June 16 ...	Grindleford Hill Climb (Sheffield A.C.).
June 23 ...	South Harting Hill Climb.
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
July ...	Motor Yacht Club Reliability Trials.
July 2 ...	Hill Climb (Wolverhampton A.C.).
July 5 ...	Gymkhana at Wadslay Bridge (Sheffield A.C.).
July 14 ...	Run for Crippled Children (Sheffield A.C.).
July 14 ..	"Henry Edmunds" Hill Climb.
July 21	Motor Union Meeting (Bath).
July 21 ...	Mablethorpe Sand Races (Lincolnshire A.C.).
Aug. 6-18 ...	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8 ...	International Cup (Motor Boats) Eliminating Race.
Aug. 9 ...	International Cup (Motor Boat) Race at Ryde.
Sept. 22 ...	Motor Union Meeting (York).
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

May 14-31 ...	Milan Reliability Trial.
May 22-June 3	Tour de France (Motor Cycles and Voiturettes).
May 27 ...	Motor Bicycle Championship (Moto Club de France).
June 4 ...	Rochet-Schneider Cup (Auvergne Circuit).
June 6-13 ...	Herkomer Cup.
June 17 ...	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26-27 ...	Grand Prix (A.C. de F.).
June 28-29 ...	Kiel Motor Boat Races.
July 8 ...	Motor Bicycle International Cup Race (Austria).
July 14-17 ...	Ostende Meeting.
July 15 ...	Mont Cenis Climb (Turin A.C.).
July 26-Aug. 15	Circuit Européen.
Aug. 13 ...	Ardennes Circuit.
Aug. 18 ...	Coupe de Liedekerke (Belgium A.C.).
Aug. 26-Sept. 2	Brescia Week (Italian A.C.).
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15-16 ...	Mont Ventoux Hill-Climb.

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

The Local Government Board and the R.I.A. No doubt the Local Government Board, and particularly its President, are very hard worked. They have probably more to do than they can effectively accomplish, so that one must not take a very pessimistic view when they adopt a *non possumus* attitude on an important question. All the same, the reply that they have given to the representations and suggestions of the Roads Improvement Association on the wearisome, but not less important, and one might, in fact, say burning, question of dust elimination, gets as near to the snub courteous as is often administered by a Government Department to a public institution of recognised standing and importance. On another page we give the correspondence that has passed between the Association and the Local Government Board. From this it will be seen that a number of practical and very useful suggestions, framed mainly with a view of introducing (by the intervention of the Board) co-operation amongst local authorities, were put before the Board, and that the Board, to all intents and purposes, has refused to entertain any of them.

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Better Luck Next Time. Of course an official douche of cold water is not by any means infrequently the prelude to favourable Government action, and it would not surprise us to find that, in spite of the views expressed, the Local Government Board may before very long initiate some action on its own account. The Roads Improvement Association has always pointed out, and there is no doubt about the truth of their contention, that only by the uniformity of practice encouraged, if not enforced, by a central authority can the problem be ever effectively and satisfactorily tackled. The only central authority at present occupying a position that would enable it to adopt this *rôle*, is the Local Government Board, and we therefore sincerely trust that its luke-warm attitude on the question will not be permanent.

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The Automobile Liability Bill in Germany. When dealing with the rumour in our issue of March 10th that this amazing measure was really shortly to be introduced into the Reichstag, we regarded the prospect with a good deal of scepticism. We were unable to believe that a sensible legislature—above all the legislature of a country in which the automobile movement has developed so magnificently—would ever sanction such a law. It is difficult to see how, if it is ever actually passed, it can have any other effect than that of wrecking the German automobile industry. Nevertheless, the incredible, or part of the incredible, has happened. The measure has been read for the first time in the Reichstag, but still we are sceptical that in its present form it will ultimately take its place on the Statute Book. For those who wish to call to mind what it would really mean, we would refer to THE AUTOMOTOR JOURNAL of the date mentioned. It is sufficient to recall that where an automobile is the cause of an accident, the automobilist will have to take full responsibility apparently whether the accident is his fault or not, and that he will have to provide funeral expenses and pensions, or to keep the family of the "accidented" person (if a family man) until he recovers, and for life if he is permanently injured. Such a law would involve a quixotic heroism, of which it is no reproach to say we do not think many Germans capable, to own or drive a car at all, and German manufacturing firms may be but too probably compelled to depend entirely on foreign markets. That considerable effect will in that case be produced on the English market is only natural, but, after all, the first reading only means the recognition of a principle, and the Bill, as it ultimately emerges from the Reichstag, will probably be an altogether different affair from what was originally submitted to the deliberations of that body. In case the Bill at present introduced should not be enough to kill the German automobile industry completely, another measure for heavily taxing such cars as may still continue to exist is also threatened. It must be admitted that these reactionary absurdities are more suggestive of a lunatic's dream than anything else—they are far beyond the wildest comic opera.

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One of the Advantages of the Motor Cab. As was pointed out by Lord Bacon in one of his famous essays, martial men are somewhat given to enjoying themselves, and it has accordingly been by no means an unusual phenomenon for those abroad early in the morning to witness a hansom cab on the road between London and Aldershot, with a sleepy aristocratic looking gentleman inside it, and an even sleepier cabman perched up behind. The interpretation usually put upon this phenomenon has been that some officer had missed the last train and had to be on parade in the early morning. Aldershot is the only military post near London to which belated officers could take cabs when they missed their midnight train. But now the motor cab is going to alter all that, and is bringing even Colchester into the radius to which trains may be missed without entailing disastrous consequences. This feat, at any rate, has been performed by one young officer recently, who, it is true, paid five guineas for his outing, but considering that the motor cab practically replaces a special train, for which the minimum fee is somewhere round £50, it is plain that as its numbers increase it may produce quite an effect upon society.

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The Railway Companies and the Industry. In the system of freights and other charges made by the British railway companies, the commercial and industrial development of Great Britain has but too often found one of its principal and most permanent obstacles. Our readers will not have forgotten the attempt made some time ago to cripple the automobile industry by the imposition of severe and drastic restrictions on the carriage of petrol. These restrictions, though we understand they still exist, have not been so drastically enforced as on their first introduction, and serious inconvenience from that cause, owing largely to the energetic action of the great petrol producers, is not now usually felt. But there are a number of other anomalies which exercise a far from encouraging effect on the development of automobile enterprise, and curiously enough many of them equally affect the allied industry of carriage building. Among these may be pointed out that partly finished portions of the body work of cars and carriages which are being sent to the works at which they will be finally finished and completed, are placed in a class in which the tariff is higher than that of any other class of goods. Then the minimum rate for a "body" is taken at 5 cwts.

in all cases. In does not matter whether the body is for a light car or a 40-h.p. Daimler, or a governess cart. Whether it weighs only 1 cwt. or less, it is charged as if it weighed 5 cwts., and the result is that the unfortunate manufacturer has to pay as much for a light body being sent to his works as he would for the heaviest article of a similar kind suitable for the largest car or landaulette. These very unfair methods of charging for freight would, one might have imagined, have been sufficient to please even the most fastidious board of directors. But several companies have recently "gone one better" and are refusing to customers the concession of packing light bodies inside one another and sending them as one consignment, with the result that the cost of freightage is enormously increased.

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Combined Action Needed.

The above instances do not by any means exhaust the list of disabilities under which the manufacturers of motor vehicles or ordinary carriages suffer at the hands of the railway companies. It is quite obvious that such unreasonable and unfair charges tend to handicap both industries in the bitter competition with foreign rivals. A movement has in consequence been inaugurated by the Institute of British Carriage Manufacturers, in conjunction with the Manufacturers' Section of the London Chamber of Commerce and the Society of Motor Manufacturers and Traders, to approach the Associated Railway Companies with a view to securing more rational treatment. For this purpose they have drawn up a memorial, to which they have already obtained a large number of signatures, calling attention to the anomalies above referred to, and asking for more reasonable treatment. The movement is one which concerns the English automobile industry very closely. Vastly more satisfactory though its position is to-day than it has ever been before, the competition with foreign manufacturers is still so keen that our manufacturers certainly cannot afford to give anything away, and it is therefore to be hoped that everybody interested in the movement will take an early opportunity of putting his signature to the memorial. The question concerns the buyer as well as the maker, for it is he finally who has to pay an increased price for these extortionate freight charges.

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Magistrates Milder.

THE gradual change in the views of magistrates regarding police traps and the tactics of the police generally towards automobilists, of which we noticed long ago the first indications, is becoming more and more apparent. Thus recently we have had Mr. De Grey, of the South Western Court, declaring that the speed of a car could not be accurately ascertained by a police stop-watch over so short a distance as 220 yards. That is a correct appreciation of the situation, of which a year or two ago probably no magistrate would have been capable. Similarly the Sheriff of the Stonehaven district recently, in convicting several motorists who were fined for exceeding the speed limit, and imposing the moderate penalty of £2 each, added that in his view such cases were not serious, and that a conviction should not follow unless it was clearly proved that the driving was to the danger of the public. He also added that he thought "it was a pity that such a trap should have been laid in an unfrequented and safe portion of the road, and that it would have been much more satisfactory to catch people going too fast where there was *real* danger." He further remarked that he "thought it only fair the victims should be warned that they had been timed, and that it ought not to be beyond the police authorities to devise means of giving special warnings." As if they ever want to do so! Convictions, convictions, convictions, are all that they are after. When a policeman has obtained a sufficient number of convictions, quite irrespective of what they are for, he is promoted.

When a Bridge is not a Bridge.

UNDER the Finchley Road, between Golder's Green and Finchley Station, runs a cylindrical sub-structure of masonry known as the Regent's Park Road Culvert. This structure, we understand, is a considerable distance below the surface of the road. But it has suddenly occurred to the Middlesex County Council that it may, by violently stretching the ordinary sense of language, be regarded as a bridge, and they have put up a notice prohibitive of heavy motor cars, under Article 14 of the Heavy Motor Car Order of 1904, from proceeding over the same. The Motor Van, Wagon, and Omnibus Users' Association, which is always on the lookout to resent and prevent any unjustifiable encroachment on the interests it represents, has accordingly memorialised the Local Government Board on the subject, and pointed out that the culvert is not a bridge but simply a culvert, and that there is no power conferred on any local body to prohibit the passage of any vehicle over anything but a bridge. The action of the County Council, therefore, has the appearance of being *ultra vires*, and in this case the owners of heavy motor vehicles would be justified in disregarding it. Presumably the Association will back them up in resisting any action that may be brought against them for doing so, and that, perhaps, will prove to be the most effective method of dealing with the situation.

$CaCl_2$ Triumphant.

QUITE long ago it was recommended in the pages of this journal that the addition of a certain proportion of calcium chloride to the water with which roads were sprinkled would probably be found a useful and cheap method of alleviating the dust nuisance, owing to the fact that calcium chloride under all circumstances remains moist. We fancy we were almost the first, if not the first, to put forward the proposal, and we therefore learn with satisfaction that experiments on a considerable scale have been carried out at Northwich, with the substance in question. At the recent meeting of the Urban Council of that town, the surveyor stated that these experiments had been remarkably successful, that the mixture had proved an admirable preventive of dust, and that considering the length of time the effect lasted, the cost was lower than that of ordinary street watering.

Islington Borough Council.

MR. BRYAN, of the Islington Borough Council, has recently brought forward a motion to consider the question of promoting legislation (in conjunction with the London County Council) for "dealing" with the problem of motor traffic in London. This sounds rather ominous, the question of motor traffic in London, except, perhaps, as regards noisy 'buses, not being a very pressing question. We would move to omit the word "motor" before the word "traffic" in this resolution, for the horse-drawn traffic of the Metropolis requires far more "dealing with" than the motor traffic.

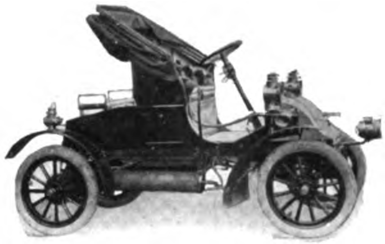
How to Recognise the Cars of To-day.

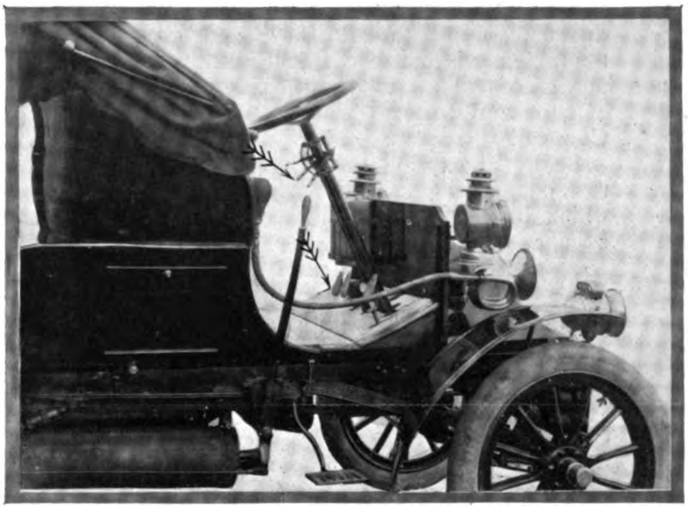
(No. 31.)

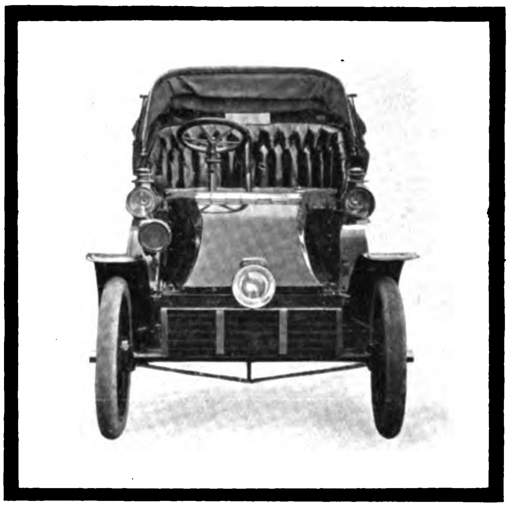
The Adams-Hewitt

(BRITISH)

10 H.P.

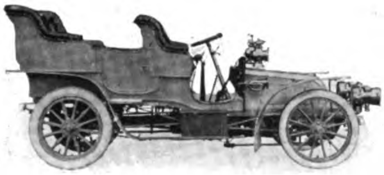






These small single-cylinder cars are distinguishable by the bonnet-shaped tool box in front, by the RADIATOR, which is placed beneath it in front, and by the large EXHAUST-BOX, which is visible at the side. It also has three FOOT-PEDALS and there are three CONTROL LEVERS on the steering-pillar. There is only one side-lever, and that operates the brakes.

* * *

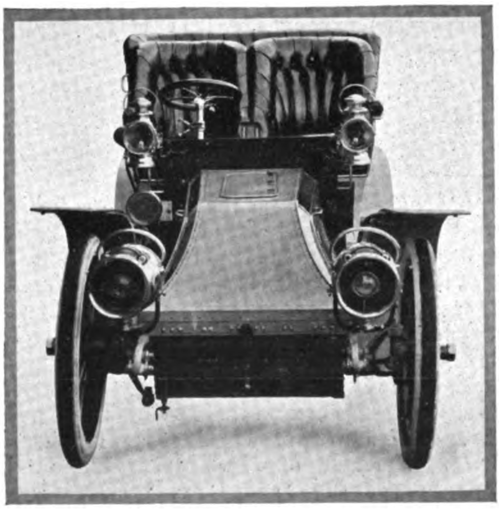


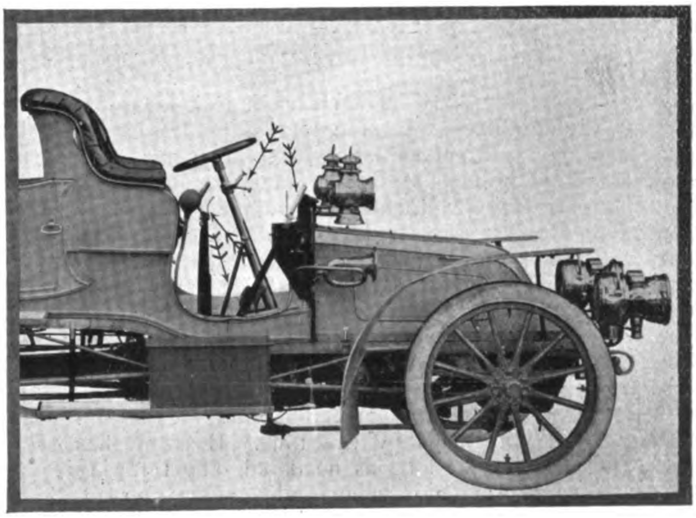
(No. 32.)

The Wilson-Pilcher

(BRITISH)

12-16 H.P. & 18-24 H.P.





These cars are noticeable by their very WIDE SLOPING BONNETS, and by the peculiar shape and arrangement of the SIDE LEVERS. Of these the change-speed lever is particularly noticeable on account of its curved handle, but in addition to this lever there are two others for the reverse and brake respectively.

THE RACE FOR THE MILAN GOLD CUP.

Florence, May 19th.

(By Our Special Correspondent).

For sheer endurance, both of men and cars, the Milan Gold Cup will in all probability establish a record among motor car contests. Up to the present, little more than one-half of the 3,000 odd miles has been covered, and many more thousands of metres of steep hill-climbing remain to be overcome. Some of the hardest day's trips are yet to come, and many of the men and cars still in the contest are showing such signs of the terrible strain, that it makes speculation on the result next to useless.

The Milan Gold Cup is called by courtesy a Reliability Trial, but the term is a rank misnomer. An Endurance Test, of the kind the Americans call "gruelling," would be nearer the mark. This is the average day's programme. Up before daybreak, in your car at the official garage the instant your name is called, follow the leader to a spot two or three miles out of the city, when at every two minutes' interval the car at the head of the line is given the word "Go!" Then a break-neck race over chalky Italian roads, surmounting crumbly Italian mountain passes, through miles of soapy Italian mud, and as likely as not, hours of soaking Italian rain, till the mid-day control, anything from a hundred to a hundred and fifty miles from the start, is reached. Then a hasty snack for man and car, and off again over another hundred miles or so of equally difficult country and generally worse weather, until you pull up at a respectable distance from the "arrivo" to wait the time for the last short spin, so as to get there as near as possible to the minute allowed by law or the rules of the contest.

MILAN GOLD CUP RACE.—Macdonald on the 6-cylinder Napier (San Giorgio) arriving first, as he subsequently arrived at all the other daily destinations, at Bologna.

There may be speed laws in Italy, but if so, they are shattered to smithereens by this time. Everyone has gone helter-skelter as long as he dared, only throwing in second speed when a wretched winding mountain road, full of hollows and slippery with rain, has made second speed or even first speed a matter of life or death. Squatty little Italian soldiers have lined the approach to villages, and cars have scurried past them without so much as "by your leave." Picturesque groups of peasants, up to their arm-pits in verdant meadows, quaint bullock teams on the roadway, old enough to have done service in Cæsar's baggage train, bare-headed padres in cassock and surplice preceded by acolyte with tinkling bell and lighted candle, mile after mile of promising vineyards, glorious stretches of sunny Italian landscape, shrines and churches without end, ancient monuments, ruined temples, modern factories, mountain torrents crossed by prehistoric bridges—all have been passed in this mad scamper through Italy to prove the reliability of the motor car—and better still to touch, if possible, a portion of that 150,000 francs prize money and the load of cups and trophies which await the winners of this Coupe d'Or contest.

Before attempting to disentangle the panoramic blur that comprises one's impressions of the past week—which, by the way, looks like a year—just a few words to say how we stand at present.

To put in a nutshell the rules of this contest, it should be understood that a maximum speed of 40 kilometres an hour is the allowance. Any competitor arriving home ahead of this allowance is penalised double for every minute he lops off. But those reaching home behind time are only penalised according to the exact time they lose. So it becomes a matter of "getting there" on the very stroke of the minute, that is to say, within a minute each way of the exact time allowance, according to the hour you may have started. This means that everybody makes a hard race of it until he reaches a safe distance from home, and then it becomes a matter of nice calculation to pass the judge's box on the very nick of time.

In the effort to be in to the exact time a very interesting position has been created, of which Macdonald, on his Napier—or as they call the car in Italy, "San Giorgio"—is undoubtedly the leading figure. Being the first to leave every morning, his has been the most difficult task of pathfinder, a matter of no small moment over such a country and among a peasantry of such monumental stupidity. Yet every day he has held his position bravely, the cry at every "arrivo," "Macdonald, Macdonald!" informing judges and spectators that the cars were coming home. The glory of being the first to cross the tape has been amply merited in his case, and the few seconds of miscalculation of the last short laps, sometimes the result of interference by the crowd, as on the occasion of his reaching Florence, where he was "held up" for twenty-two seconds, should not in all fairness be held as impairing the perfection of his performance. That the 6-cylinder Napier has amply met the expectations of its supporters is shown not only by Macdonald's score, but by the equally perfect record of Glentworth, who has arrived home with almost the regularity of clockwork every night—and speaking of clockwork, it may be an interesting question how many of the official timekeepers' watches have varied less than forty seconds during the continuous night and day travel of the past week. Yet Glentworth's time, as checked off by official chronometers, is, at the time of writing, within forty seconds of the exact score which constitutes nominal perfection.

Since the procession of cars was formed in the park adjoining the Milan Exposition, in the wee sma' hours of the Monday morning (of some time last century, it seems), it has been one constant grind of the hardest kind. Yet the forty-eight cars that marshalled past the captive balloon in the Exposition grounds and followed the leader to the place called Rigosetto, five miles outside the city, were all filled with men determined to do or die. A large proportion of the cars carried three passengers besides the driver, while others made up the complement of four by taking along an Italian soldier or policeman to the starting post. But other drivers who could well have afforded to take a fourth man along were deaf to all entreaties, and flatly refused to recognise any recommendation or letters of introduction from English representatives of their respective firms. And upon this point let me say that the arrangements for the accommodation of the Press could hardly have been poorer. This I quickly discovered after presenting my credentials as correspondent of THE AUTOMOTOR JOURNAL, and, like others, was given a copy of the rules and programme of each day's run and practically told to do the best I could to find out where the starting post was, what was the order of running, where any of the combatants might be found, or, in fact, any glimmer of information on which to begin an intelligent report of the race. To get to the starting post one might walk or take a cab. and after that it was a case of shift for yourself. The printed programme of the itinerary mentioned a hotel at the end of each day's run, and there was naturally expected to find the headquarters of the race officials. Foolish expectation.

If there was one hotel in the town where you could look in vain for an official, and where everybody, from the boots to the manager, was densely ignorant of anything and everything about the race, it was the hotel mentioned in the official programme. I had a beautiful illustration of this at Rome, where I arrived at the "official" hotel the sole occupant of the lumbering omnibus. Not a motorist—French, Italian, English, or any other nationality—was to be seen around the place.

"How far is it to the 'arrivo?'" I asked the manager, showing him the programme printed in Italian.

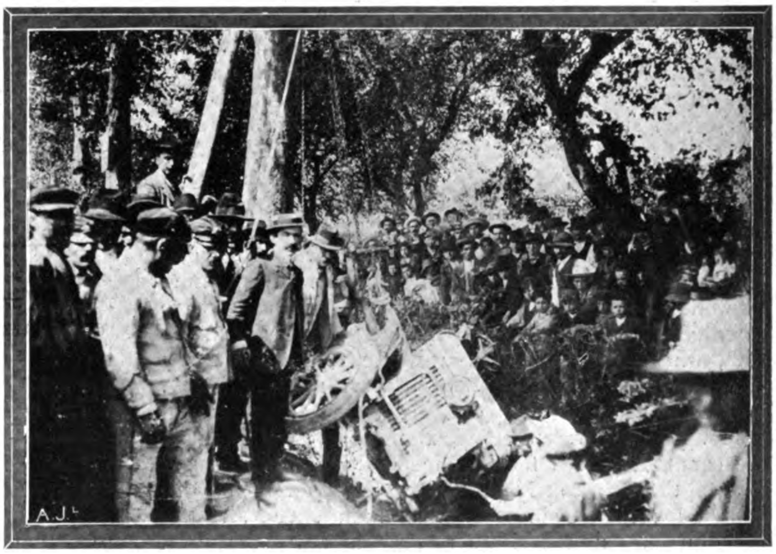
"Only a franc's ride," he answered. And to protect me against overcharge he wrote down the name, "Poste Salario," on a slip of paper, which he showed to the brigand cab-driver.

On reaching the place indicated we found a swarthy lot of bandit-looking people gathered, but not a sign of any "arrivo."

Then the cabby got busy asking questions on his own account, the upshot of which, I gathered, was that the hotel man had made a mistake, and it ought to be Ponte Salario—not Poste.

"All right," I shouted in plain English, "Ponty or Posty, its all the same, only get there."

It was raining cats and dogs at this time, and the open cab, with an umbrella top, was anything but the most comfortable vehicle under the circumstances, especially as I had left the hotel minus a waterproof or umbrella. The cabby said afterwards it was five miles from Ponte to Poste, but, as I sat there, huddled under that ramshackle cover, getting wetter and wetter every second, it seemed to me more like twenty. We did finally reach the place, where the yellow streamer across the road, with the word "Arrivo," denoted our destination, and I made a dash through the pelting rain for the judge's stand. This consisted of a table about two feet long, at which the official scorer sat. At each elbow sat two of the club officials, and craning their necks to catch a glimpse of the scorer's figures, were two French pressmen, who were barely able to huddle underneath the square yard of canvas cover overhead. The Frenchmen were the only ones who would speak French, the Italians showing a lordly contempt for anything but their native tongue.



MILAN GOLD CUP RACE.—The Daimler Car being hauled on to the road at Castellfranco, after the bad accident on the first day.

That was a sample of the Italian idea of accommodation for foreign Press representatives. When I went back to my cab, half an hour later, feeling like a drowned rat, and willing to forfeit a year's salary if I could only have sworn in Italian instead of English, the cabby was of two minds whether to demand my fare then and there, or to leave me to my fate at Ponte Salario. He decided that I couldn't wet his cushions any more, so he drove me back to Rome, and instead of the modest franc or two francs originally agreed upon—when we spelled it Poste—he made it nearer twenty. I paid it, if only for the privilege of escaping from his soaking cab.

And then the morrow had once more to be thought of. Instead of the weather improving day by day as the trial goes on it seems to get worse, the roads following suit, and uniting to confound the half-asleep drivers and passengers who, bar accidents, are pledged to go through this fearful Italian ordeal to the bitter end.

J. P. H.

Owing to the early starts and continuous running the greatest difficulty exists in ascertaining accurate particulars of the occurrences of each day's journey. From the officials little or nothing can be gleaned, and for any authoritative figures and statements those interested must remain patient until the official results are issued. By degrees, however, day by day, the fearful nature of the roads, combined with the unprecedentedly bad weather, have served to eliminate at the time of writing considerably more than half of the 48 cars which started on Monday, May 14th, from Milan. On the first day, which was to Bologna, a distance of 432·7 kiloms., 7 of the 48 succumbed. The second day, to Rome, a distance of 451·8 kiloms., accounted for the elimination of a further seven cars, including Lionel De Dion, who abandoned the contest owing to a collision with Lanfranchi on an O.T.A.V. car. In the time allowed of 11 hrs. 18 mins., thirty-four cars were recorded at Rome. Both on this day and the next, the 16th, when the run was from Rome to Naples, 254·7 kiloms., torrential rain poured down the whole day. For the short and comparatively easy run to Naples, 6 hrs. 9 mins. was the official time allowed, and all the cars that started from Rome on this day managed to get through to Naples, one, however, being disqualified for exceeding the maximum speed allowed. Macdonald, on his Napier, had a narrow squeak when travelling downhill, through a dog striking his steering-rod. By very smart application of the brakes, however, he succeeded in saving the situation, bringing his car to a standstill within a few inches of the edge of the road. Macdonald, nevertheless, still came in first at the end of the day, and the second Napier, driven by Glentworth, was timed 7th, after having started from Milan 23rd. In the Italian cars, the Fiats, Italas and Fraschinis were all keeping splendid time, the regularity of the running of the latter being particularly noteworthy. An unpleasant feature of the day's journey was a considerable amount of stone-throwing at the passing cars, which in several cases resulted in injury to passengers. From Naples, on the next day, May 17th, the return journey to Rome was effected by a different route, the distance being 227 kiloms., for which the official time allowed was 5 hrs. 40 mins. During this run three of the competitors were disqualified for exceeding the speed limit, and through the hurling of missiles by some of the ill-disposed natives, Cormier's De Dion-Bouton car was a bad sufferer, his radiator causing him serious delay. Glentworth was also unfortunate on this day in suffering damage to his petrol tank. In accordance with the rules, he was unable to remedy this when the car was put under lock and key upon arrival at Rome, and in setting the damage right the following morning at a local repairer's he lost 40 mins. before starting, in spite of which handicap, however, he managed to creep into sixth place by the time he reached Florence. This was on Friday, the 18th instant, when that city was the day's destination, a distance of 371·5 kiloms., for which the official time allowance was 9 hrs. 17 mins. Of the 28 left in at the start from Rome, 27 reached Florence. The officials on the evening of this day were busy examining the sprockets of each car, to ensure that no changes had been made, as the next day's journey (Saturday) to Genoa was likely to prove the most trying run of the race, so far as continuous climbing was concerned. On this day somewhat of a gloom was experienced by the travellers at hearing the news that M. Pasquali had succumbed to the injuries he received in an accident on the third day between Rome and Naples, when, owing to a bad side slip at Sessa Aurunca, he was very badly injured, the car dashing against a tree. Genoa was the finishing point for the next day (Saturday, May 19th), no less a distance than 436·4 kiloms. having to be covered in 10 hrs. 55 mins. over probably the most trying course which has been selected for any reliability test. Of the 27 which started, 23, however, managed to survive the day. To make matters more trying very violent rain continued without ceasing, rendering the fearful mountain roads murderously treacherous. Four mountain passes, one over 6,000 feet, had to be climbed, under the most trying conditions it is possible to conceive. Macdonald again on this day succeeded in maintaining his premier position; Glentworth, with ignition troubles, through defective charging at Milan, being less fortunate, thereby losing a little time. The run on Sunday, the 20th, to Turin, of 448·2 kiloms., official time allowed 11 hrs. 19 mins., accounted for a further elimination of three competitors, thus reducing the number still running to twenty. On this day the series of climbs were resumed at the outset, followed by good level travelling on the coast road, the latter portion of the journey. In spite of one puncture for Macdonald and three for Glentworth, both managed to maintain their positions at the finish of the day. The question, however, of the accuracy of the watches employed by those in authority for timing the cars had by this time become a very heated subject, it being claimed that discrepancies in this respect were solely responsible, at least in the case of the leading Napier, for the penalisations of seconds, beyond the official time allowed.

The following are the penalisations up to the 8th day which have been compiled *unofficially*:—

Driver and Car.	h.	m.	s.	Driver and Car.	h.	m.	s.
Macdonald (Napier) ...	0	2	8	Arbitrio (Diatto-Clement)	2	26	28
Cagno (Itala)	0	0	40	Pfanz (Benz-Parsifal)...	0	40	51
Lancia (Fiat)		—		Minora (Isotta-Fraschini)	1	28	45
Vercellone (Diatto-Clement)	1	18	14	Fabry (Itala)	3	18	27
Bossano (Benz-Parsifal)	0	9	3	Nagliati (De Dion-Bouton)	8	15	30
Glentworth (Napier) ...	0	6	51	Martini (Martini) ...	3	1	50
Maggioni (Zust) ...	0	0	7	Fraschini (Isotta-Fraschini)	0	1	28
Nazzaro (Fiat) ...	0	0	14				
Von Lude (Martini) ...	5	58	17				
Boschis (Fiat)... ...	0	1	27				

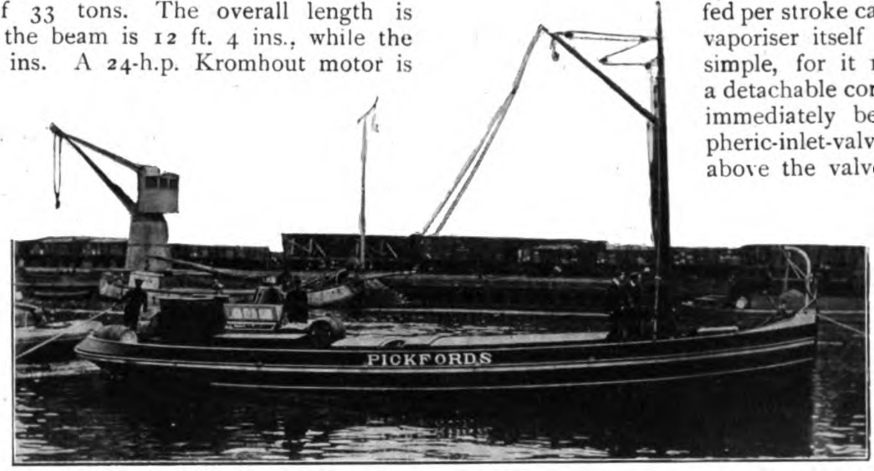
With the Sunday's run the more arduous part of the whole run had been overcome. The run on May 21st to Milan of 226·9 kiloms., 6 hrs. 40 mins. official time allowed, in contrast with the previous day's up and down hill journeying, was through practically flat country, and it is not surprising therefore that the twenty competitors who had managed to survive the fearful ordeal of the first week's travelling, found the easier stage mere child's play by comparison. Two more cars, however, succumbed, leaving eighteen still running. Once more Macdonald was first in at the finish, with Glentworth also up to time. Unfortunately the big reception which had been prepared for the "tourists" at Milan was entirely neutralised by the awful weather experienced on this journey. The ninth day's run on May 22nd to Udine, although the longest journey of the whole trial, viz., 468·8 kiloms., official time allowed 11h. 30m., was a mere picnic to the drivers, as for all practical purposes the road from start to finish was level the whole distance. The two remaining stages on May 23rd and 24th were respectively to Brescia (the last of the hill climbing), 405·6 kiloms., and back to Milan, 158·2 kiloms.

Everything, at the time of press, points to the Cup and the team award being secured by the Fiat cars.

* * * *

THE "WASP"—PICKFORDS' NEW MOTOR BARGE.

SLOWLY but steadily the internal combustion engine is forcing its way into the marine world, and now there has just arrived in England the first motor barge to be placed in regular commercial service. It has been acquired by the well-known carriers, Messrs. Pickford, having been supplied to them by Perman and Co., as English agents for Messrs. Goedkoop, of Holland. The "Wasp," as this new boat is called, is for service between the mainland and the Isle of Wight, which passage constitutes a very important item in Messrs. Pickfords' business; so important, in fact, that they have for a long time employed their own fleet of tugs. As a barge, the "Wasp" has a dead weight carrying capacity of about 20 tons, and a cubic capacity of 33 tons. The overall length is 55 ft. 6 ins., and the beam is 12 ft. 4 ins., while the draught is 3 ft. 6 ins. A 24-h.p. Kromhout motor is installed, and it is anticipated that this will be sufficiently powerful to enable the boat to attain a speed of approximately 7½ knots.



Messrs. Pickfords', Limited, new coasting motor barge, which was mentioned in "The Automotor Journal" last week. This barge is driven by a 24-h.p. single-cylinder Kromhout motor. She is fitted with a winch capable of dealing with packages weighing up to 10 cwt. Altogether she carries 40 to 50 tons. The barge's dimensions are :—Length, O.A. 55 ft. 6 ins.; length, L.W.L. 52 ft. 1 in.; beam, 12 ft. 3½ ins.; draught, 3 ft.

It will be remembered that a boat fitted with one of the Kromhout engines figured prominently at the Motor Yacht Club's Reliability Trials last year.

The engine on the "Wasp" is similar in design, but of a larger size, and although capable of developing 24 h.p., it has only one cylinder, the dimensions of which are 260 mm. bore and 338 mm. stroke (10¼ ins. by 13½ ins.). It is placed vertically, and runs at a normal speed of 276 revolutions per minute. Paraffin is used as fuel, and about ¾ pint per horse-power per hour is the normal consumption at full load. At 5*d*. per gallon an hour's running would, therefore, cost only about 11*d*. For the purposes of starting, a little petrol is employed, but once under way the engine continues to work on the heavier oil. The construction of the engine is extremely simple, and is very substantial, it having been designed entirely with a view to needing as little attention as possible.

The fuel is injected on to the atmospheric inlet-valve by a small plunger pump operated from the exhaust-valve tappet rod. The tappet rod itself is operated from an eccentric mounted on a short half-speed shaft, which is gear-driven from the crank-shaft. Carried by the eccentric rod, is a small inertia governor, which brings into play a simple hit-and-miss gear when the engine tends to exceed any pre-determined speed. Ignition takes place by means of a low-tension magneto, which has an oscillating armature worked by a striker from the half-speed gear-wheel. The igniter-tappet mechanism is also coupled up to the armature-spindle in such a way that both it and the armature are operated simultaneously. There is no throttle-valve, neither is the ignition capable of being advanced or retarded, but an adjustment on the throw of the fuel pump is provided by means of which the quantity fed per stroke can be varied. The vaporiser itself is also extremely simple, for it merely consists of a detachable conical sleeve, placed immediately beneath the atmospheric-inlet-valve. Fuel is delivered above the valve through a small spray rose, and when the valve opens the spray passes through on to the hot sleeve, where it is instantly vaporised. It is, of course, due to the fact that this vaporising-sleeve remains in the combustion-chamber itself, that it always retains sufficient heat to do its work.

On the "Wasp" the engine is situated well aft, thus leaving a very large amount of the total space on the boat available for cargo. An epicyclic reverse gear is provided for going astern, and there is a main-clutch of a special design in which wood is used as a friction surface. In the engine room, also, is a winch, which can be operated from the engine by means of chain gearing. As an earnest of her future capabilities, the "Wasp" came across the North Sea from Holland under her own power, and made a very successful trip. There can be little doubt that this experiment on the part of Messrs. Pickford is one of the most important practical trials which has yet been offered to the motor boat, and if successful it should mark the commencement of a very important future, and also have the effect of keeping alive the interest in the question of motor barges for our canals.

THE CLEMENT-TALBOT PETROL CARS.—PART III.

The Live-Axle.

Forming the stationary portion of the live-axle, are the two steel castings, D, the two flanges, D^1, the two tubes, D^2, and the special end castings, D^3, the arrangement and shape of which are clearly indicated in the sectional drawing, Fig. 13. The castings, D, together form the vertical-jointed casing that encloses the differential and the bevel-gearing, and these are also rendered rigid with the steel tube, D^8, that encloses the propeller-shaft, E, by means of the flange fitting, D^7. The axle-tubes, D^2, and the tube, D^8, are brazed into the flange fittings, D^1 and D^7, respectively, and the former tubes are similarly secured at their outer ends to the special castings, D^3. A very strong construction is thus secured, and this is still further added to by the tie-rod, D^6, beneath the axle.

At its rear-end, the propeller-shaft, E, carries the bevel-pinion, E^1, in much the usual way, this shaft being provided with a ball-bearing and a ball-thrust-ring which fit into the flange-casting, D^7. The extreme end of the propeller-shaft is further supported by a small ball-bearing, E^2, arranged as seen, and the bevel pinion, E^1, meshes with the large bevel-wheel, E^3, that is bolted to the differential-box, E^4.

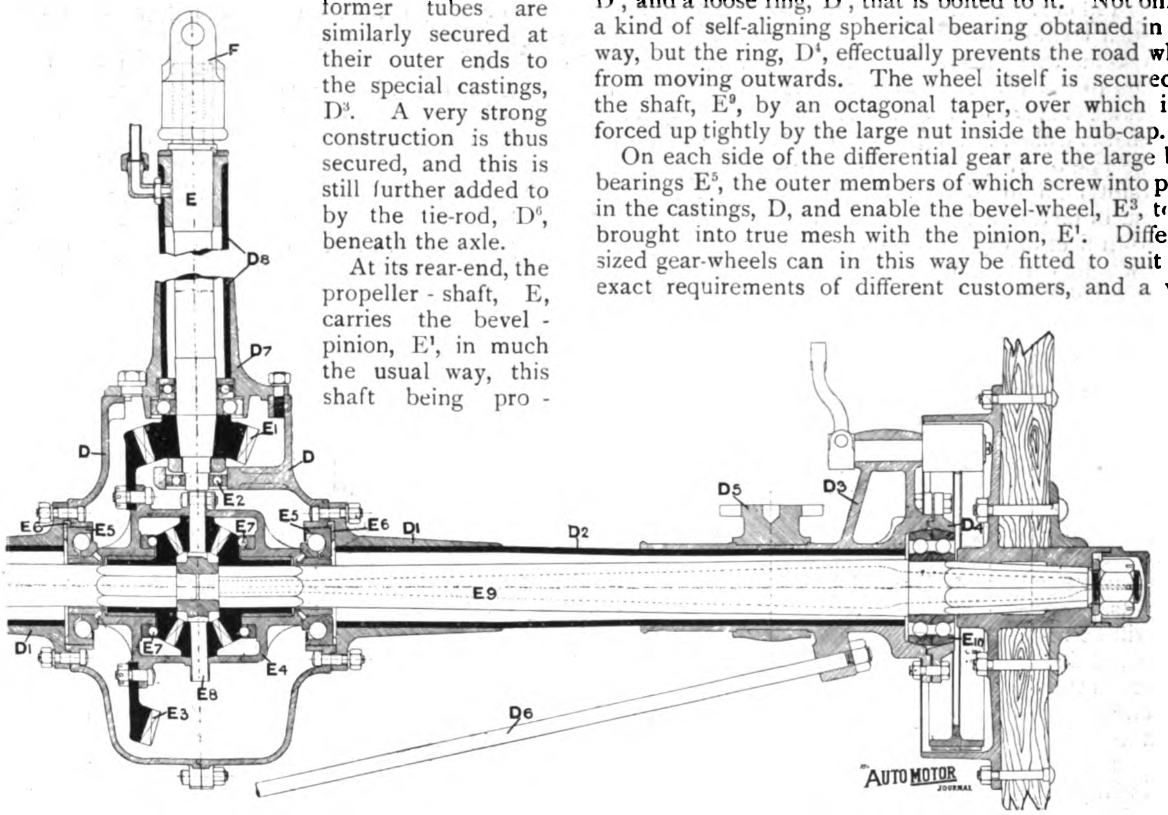


Fig. 13.—Longitudinal section of the 20–24-h.p. Clement-Talbot Live Rear Axle. The arrangement of the tube surrounding the Propeller-shaft is also indicated.

An unusual feature of the differential-gear itself is that ball-thrust-bearings, E^7, are fitted behind each of its "sun" wheels, thus compelling them to remain in true mesh with the planet wheels which revolve freely upon the spider, E^8. The "sun" wheels are carried by long bushes inside the castings, E^4, and have hexagonal holes machined through them to receive the inner ends of the shafts, E^9. These two shafts, E^9, which can therefore be drawn out at any time without disturbing the differential, are of very peculiar shape, being swaged down from a large tube so that they taper both ways, and that, in spite of being comparatively light, they are unusually strong. The section of the metal is indicated by the dotted lines in our drawing, and it will be realised that originally they consisted of steel tubes of the same size that they now are at the largest part. Their extreme inner ends are turned down to form spigots, which fit inside the spider, E^8.

Another noteworthy feature of this design is that the road wheels are carried by very large ball-bearings, E^{10}, although they do not revolve *outside* the axle-tubes, D^2, as is now customary on several other makes of car. The inner races of these bearings are fitted on the shafts, E^9, from the outside, and come up against a shoulder, while the outer ball races are held in place between the casting, D^3, and a loose ring, D^4, that is bolted to it. Not only is a kind of self-aligning spherical bearing obtained in this way, but the ring, D^4, effectually prevents the road wheel from moving outwards. The wheel itself is secured to the shaft, E^9, by an octagonal taper, over which it is forced up tightly by the large nut inside the hub-cap.

On each side of the differential gear are the large ball-bearings E^5, the outer members of which screw into place in the castings, D, and enable the bevel-wheel, E^3, to be brought into true mesh with the pinion, E^1. Different sized gear-wheels can in this way be fitted to suit the exact requirements of different customers, and a very neat means has been adopted for locking these bearings after they have been adjusted. The outer race members, E^5, are, for this purpose formed with a slotted ring around the outer face, so that the key, E^6, which fits into a corresponding slot in the casting, D, can secure them in the desired position; this key itself is prevented from moving because it is clipped between the casting, D, and the flange, D^1. Fig. 13 also shows the manner in which the brackets, D^5 (to which the springs are attached), ride quite freely outside the castings, D^3. The brackets to which the radius-rods are coupled up are, of course, rigid with the larger castings, D^3, but it is important that the spring-brackets, D^5, should ride quite freely, and they are therefore provided with grease cups to prevent them from seizing. Also rendered evident in this illustration, is the arrangement of the internal-expanding brakes that act direct upon the road wheels, these being operated through a compensating link (as seen in Fig. 2) from the brake-lever at the side of the car.

The Change-Speed-Gear.

It needs but a glance at Fig. 14, which is a longitudinal, vertical section, to see the construction of the Clement-Talbot gear-box, as well as of the universal-joint, F, by which it is coupled up to the propeller-shaft. Also included in the drawing is the foot-operated internal expanding brake, the mechanism for which is supported by the gear-box.

Except that the lay-shaft, J, is mounted immediately above the direct-through-shaft, and that a "direct-drive" is obtained on the top speed, the general arrangement of the various parts is similar to the well-known "Panhard" arrangement. Of special interest, however, are the methods adopted for mounting the shafts in their ball-bearings, and the provision that is made for taking all end-thrusts by means of ball-thrust-rings.

The shaft, G, which is that to which the propeller-shaft is attached, has a square section inside the box, and its forward end is turned down so as to take a long bearing inside the short shaft, H. At both ends of the squared portion are ball-thrust-collars, G^5, and the large bearing near the rear end of the shaft, G, is held in place by flanges on either side. The outer flange is provided with felt washers for preventing oil from finding its way along the shaft out of the gear-box, and the inner flange, G^6, is made in two halves to enable it to be slipped into place. By removing these two flanges, the shaft, G, can at any time be drawn out with ease. It is the shaft, H, that is coupled up to the engine through the main clutch and the flexible coupling, to which further reference will be made in due course, and this shaft is solid with the two spur-wheels, H^1 and H^4, that lie inside the gear-box. It is supported by two ball-bearings inside the specially-shaped flanged cage, H^2, this cage enabling it to be slid out bodily with its spur-wheels from the front of the gear-box. The ball-thrust-bearing, H^3, is also fitted inside the casting, H^2, this bearing taking the thrust when the fourth "speed" is being brought into operation. As usual, the wheel, H^1, is at all times in mesh with the wheel, J^5, on the lay-shaft, J, and the wheels, J^1, J^2, and J^3, are rigidly fixed to the lay-shaft in suitable positions to be engaged, alternatively, by the wheels, G^1, G^2, and G^3, as the latter are slid longitudinally on the shaft, G. Thus are the first, second, and third "speeds" obtained, while the fourth "speed" results from the direct engagement of the internally-toothed gear-ring, G^4, with the wheel, H^4.

Very neat is the arrangement adopted for holding the lay-shaft with its ball-bearings in place, there being easily removable plates at each end, the one having a non-adjustable, hardened steel stop, and the other an adjustment screw.

For obtaining the "reverse," two small intermediate pinions, J^6 and J^7, which are indicated in Fig. 14, are mounted upon a stationary pin in the gear-box, and are normally held in their free position by a helical spring. The large sliding-wheel, G^1, comes into mesh with the wheel, J^6, when the change-speed-lever is placed in its neutral position, and if the lever is then moved still further back in its quadrant, the wheel, G^1, pressing up against the wheel, J^7, slides the latter wheel into gear with the wheel, J^4.

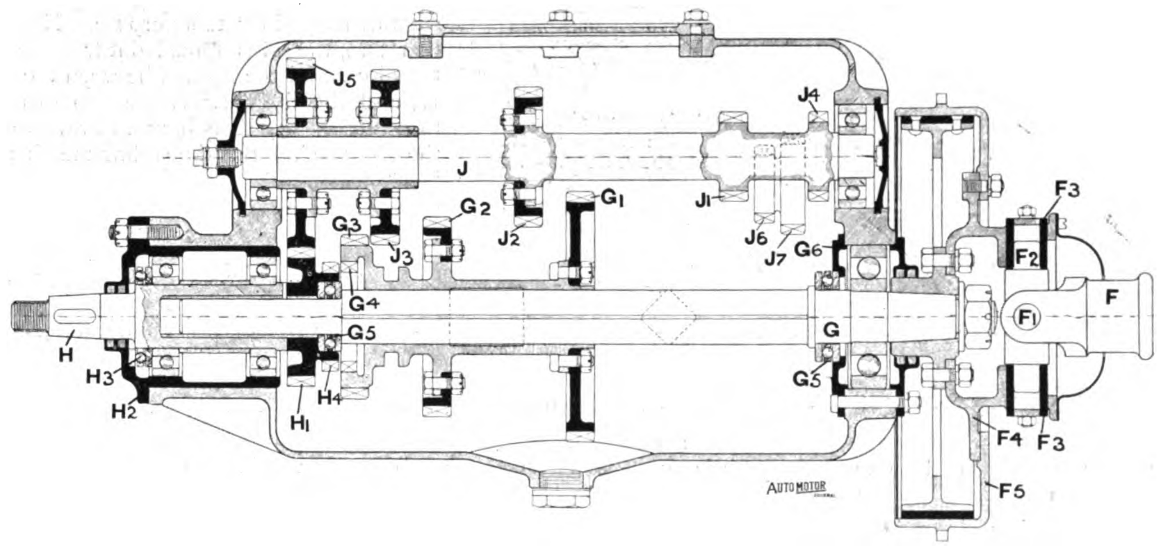


Fig. 14.—Longitudinal section through the 20-24-h.p. Clement-Talbot Gear-box, showing the special arrangement of the ball bearings for the shafts. This drawing also indicates the construction of the Foot Brake and of the Universal-joint at the front end of the Propeller-shaft.

Of simple design is the universal-joint at the back of the gear-box, for the intermediate portion, F^2, is formed with two projecting pins that slip into place in the casting, F^4, and are held there by the two sleeves, F^3. The intermediate portion, F^2, is drilled through at right angles to receive the pin, F^1, the ends of which ride in the forks of the coupling piece, F. The pin, F^1, itself is prevented from moving in the intermediate piece, F^2, by a large split pin. This universal-joint works in grease, which is retained in place by a light cover at the back.

For introducing the various speeds, the spur-wheels are controlled by a simple sliding rod, which engages with them by means of a fork, the change-speed-lever operating in a notched quadrant over which it is moved successively from speed to speed in the usual manner.

Special care is taken in the manufacture of the gear-wheels and their shafts to ensure absolute true running and long life. To this end they are made from carefully selected steel, and are ground accurately to size after having been hardened by the up-to-date plant installed for the purpose. The wheels have "formed" teeth, the edges of which are rounded off by a special machine tool.

The Multiple-Disc Clutch.

This new clutch, which is the first of its type, differs from others of the multiple-disc pattern in many important respects, for not only are the discs quite flat, but the friction surfaces are comparatively small. The advantage of a small contact area is that it enables the oil to be more easily forced out from between the plates and allows the clutch to pick up the drive, or free itself, more quickly than would otherwise be the case, whilst still retaining all the other advantages of the disc type of clutch.

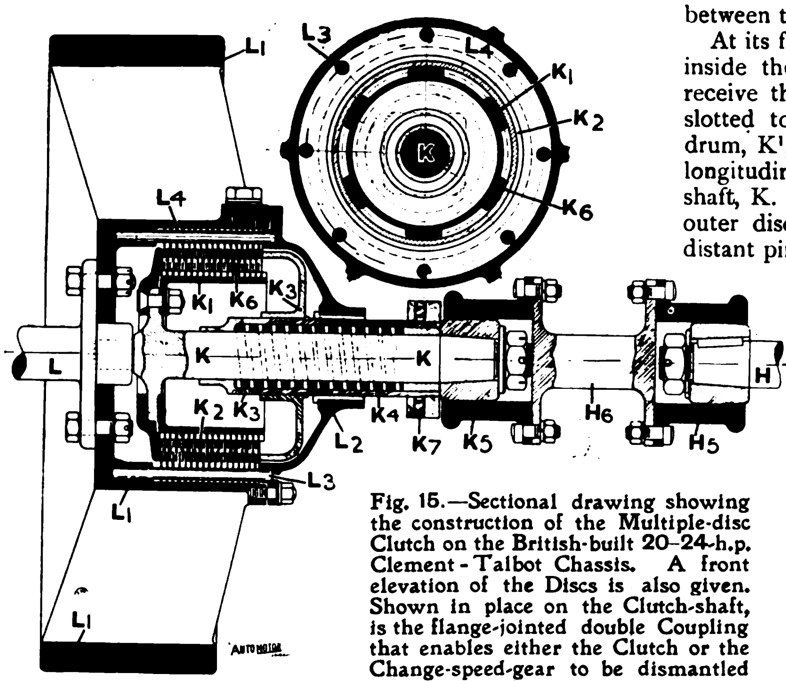


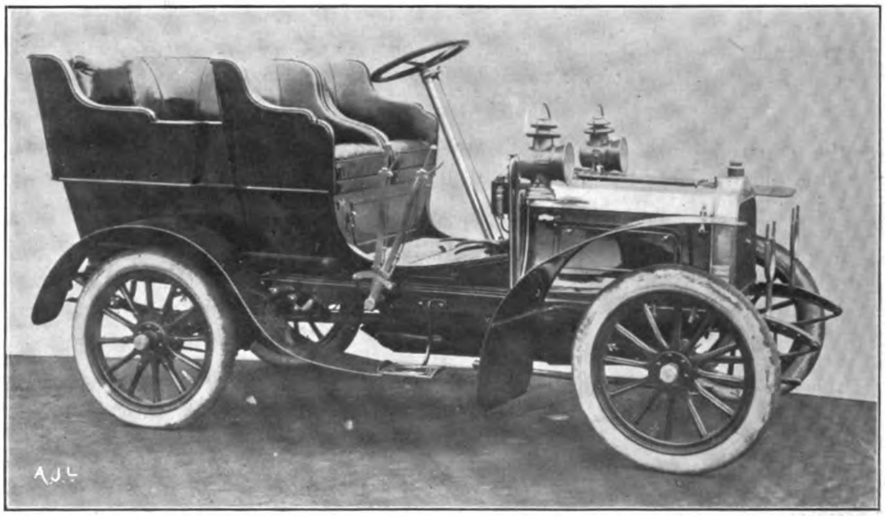
Fig. 15.—Sectional drawing showing the construction of the Multiple-disc Clutch on the British-built 20–24-h.p. Clement-Talbot Chassis. A front elevation of the Discs is also given. Shown in place on the Clutch-shaft, is the flange-jointed double Coupling that enables either the Clutch or the Change-speed-gear to be dismantled independently.

One set of discs is made of hardened steel, and the other set consists of steel plates toughened by the special process referred to later in connection with the brake liners. Made in this way the two sets of discs are found to work extremely well together without any tendency to score. An extra set of narrow corrugated discs is introduced between the plates in order to separate them when the pressure is relieved. Fig. 15 is a longitudinal section of the clutch, fitted with the flexible flanged coupling through which it drives the change-speed-gear, and in the same drawing is an end view, showing the shape both of the driving and of the driven discs.

Referring to this drawing, the fly-wheel, L^1, is seen to be bolted to the end of the crank-shaft, L, and it will also be noticed that the central portion of the wheel forms the outer member of the clutch. The spokes of the fly-wheel are so shaped as to constitute fan blades for assisting in drawing air through the bonnet, and the clutch itself is rendered oil retaining by means of the casting, L^2, which is bolted to the main casting, L^1. In this way, moreover, a bearing is obtained for supporting the clutch-shaft, K, with its sliding member, K^3, and thus no additional bearing need be fixed to the chassis between the engine and the gear-box.

At its forward end, the shaft, K, takes a spigot-bearing inside the crank-shaft, L, and this shaft is flanged to receive the disc-carrying drum, K^1. The discs, K^2, are slotted to correspond with teeth that project from the drum, K^1, and thus these discs—although free to move longitudinally—are compelled to revolve with the clutch-shaft, K. Interlacing with the inner discs, K^2, are the outer discs, L^4, these being threaded over eight equidistant pins, L^3, which are secured in place between the castings, L^1 and L^2, as seen in our drawing. For forcing all the discs up closely together, the helical spring, K^4, is introduced between the sliding-member, K^3, and a collar on the shaft, K, the sliding-member being suitably shaped for this purpose. Normally, therefore, the oil is forced out from between the discs, and the friction between the discs, L^4, and the discs, K^2, is then so great that the clutch-shaft, K, is bound to revolve with the fly-wheel. But the sliding-member, K^3, is, at its rear end—outside the main body of the clutch—provided with a thrust-collar, K^4, and it is with this collar that the clutch-pedal engages. The sliding-member is shown in its "free" position, the spring, K^4, being then fully compressed, and the discs, L^4 and K^2, being separated by the corrugated discs, K^6. It will be noticed that when the clutch is in, the pressure of the spring is balanced, thus obviating all end thrust either on the gear-box or the engine.

About $1\frac{1}{2}$ pints of oil constitutes the full oil charge which should be present inside the clutch. The clutch can be easily dismantled without disturbing the gear-box, owing to the construction of the flanged coupling, H^6, that connects these parts together. It is bolted to the outer members, K^5 and H^5, of the two flexible couplings.



The 8–10-h.p. Clement-Talbot tonneau, which is the smallest model built by this company, and has a twin-cylinder engine.

(*To be continued.*)

THE AUSTIN PETROL CARS.—PART IV.

(*Continued from page* 607.)

The Change-Speed-Gear.

Fig. 15 gives a view of the gear-box from above, and in Fig. 14 are reproduced an end elevation and a longitudinal cross-section showing the precise arrangement of the entire mechanism. A single casting forms the main portion of the gear-box, and it is consequently unnecessary to break any large joint below the level of the oil in order to make a thorough inspection of the gear-wheels. There is, however, a large flat lid which can readily be removed, and this exposes everything to view. Most important of all, it will be noticed that the second-motion-shaft, K, and the first-motion-shaft, L, are supported centrally by large ball-bearings, as well as at each end. The former shaft is so shaped at its rear end that it can receive the coupling-shaft, H^9, to which reference has already been made, and that the water-cooled brake-drum, G^5, can be bolted to it.

At its front end, the first-motion-shaft, L, is machined up with a large square to constitute part of a flexible coupling between it and the clutch, and inside the box (between the three bearings) it is provided with large feather keys for the two sets of spur-wheels to slide upon. These sliding wheels, L^1, L^2, L^3 and L^4, correspond with the fixed wheels, K^1, K^2, K^3, K^4, on the shaft, K, and give the four forward speeds as usual. Beneath them, in the front portion of the box, are the two intermediate spur-wheels, K^5 and K^6, which can be brought into mesh respectively with the wheels, K^1 and L^1, to give the "reverse."

On much the usual "Mercedes" principle, the three groups of wheels are controlled by the sliding-rods, L^5, L^6, and L^7, these introducing, respectively, the first and the second, the third and the fourth, and the "reverse" speeds. Particularly simple, however, is the mechanism by which they are actuated, and we therefore give in Fig. 16 two views illustrating it. Referring to those drawings, the shaft, M, is that which is secured to the hand-operated change-speed-lever, this shaft being as usual free to slide lengthwise, as well as to rock about its axis. Fixed to the end which projects inside the gear-box, is the lever arm, M^1, which can be made to engage with either of the rods, L^5, L^6, or L^7, by sliding the shaft, M. Pivoted by the pin, M^3, to the lever-arm, M^1, is a specially-shaped forked-lever, M^2, which hangs down, as seen in the illustrations. Its lower ends are so shaped that one or other, or both of them, at all times lock those rods which are at any time idle, for they fit into the same grooved portions as the lever-arm, M^1, and also engage with the projecting ridges of the casting, L^8. The sliding-rods themselves are supported at their rear ends in the casting, L^8, and each of them is fitted with a spring catch, L^9, that can engage in corresponding slots in them to hold them in either of their normal positions.

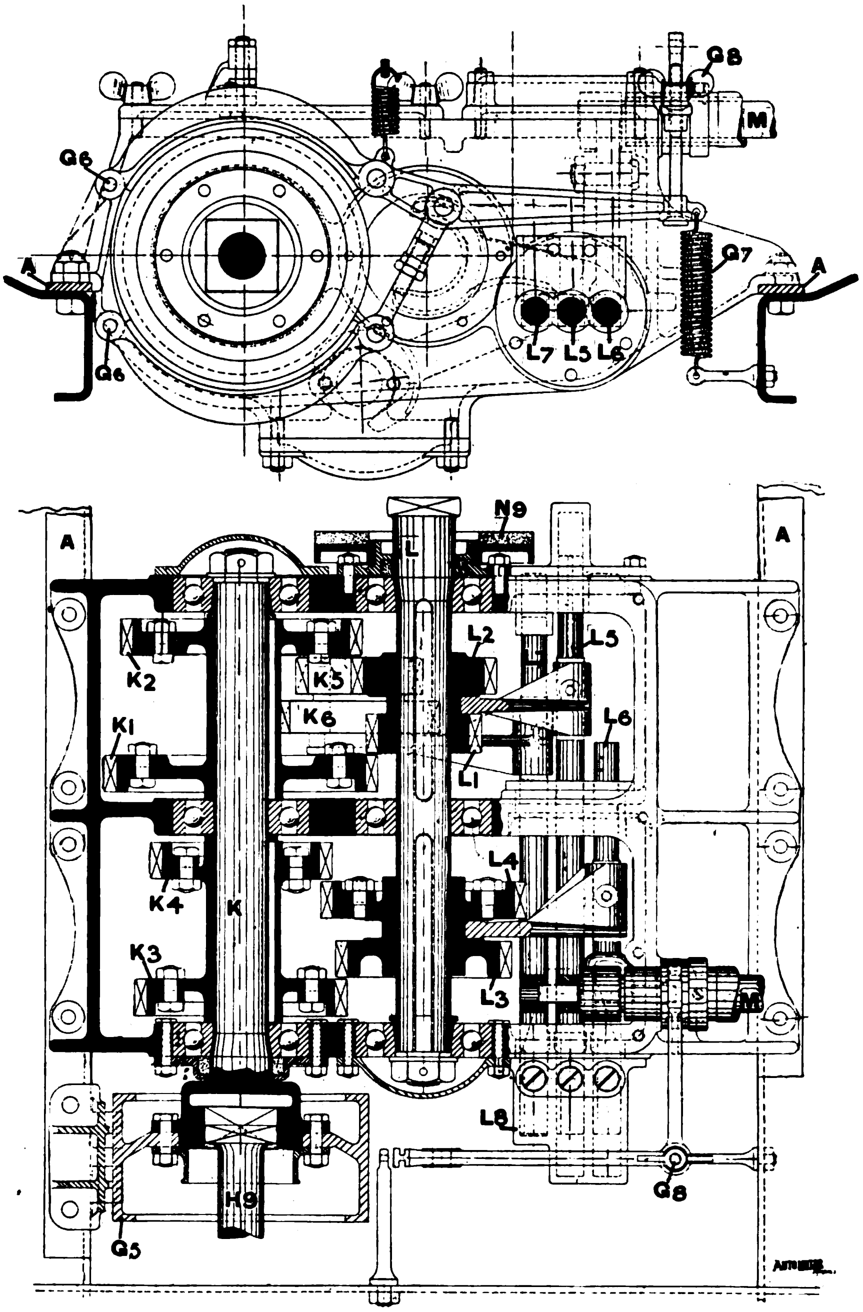


Fig. 14.—End elevation and transverse section of the "Austin" change-speed-gear, showing the arrangement of the three bearings on each of the main shafts.

The Foot Brake.

Incidentally, attention may be drawn, in connection with Figs. 14 and 15, to the arrangement of the foot-operated brake behind the gear-box. There, it will be seen that the two shoes are pivoted to the pins, G^6, and

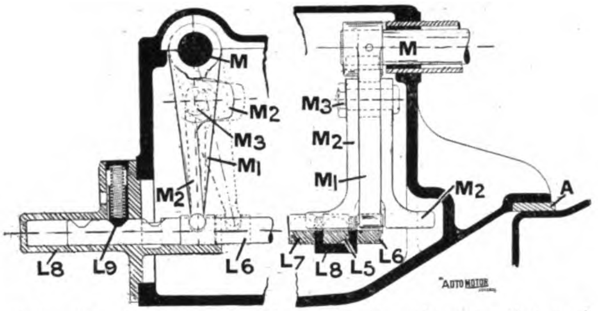


Fig. 16.—Sectional drawings showing the operating and locking mechanism for the "Austin" change-speed-gear.

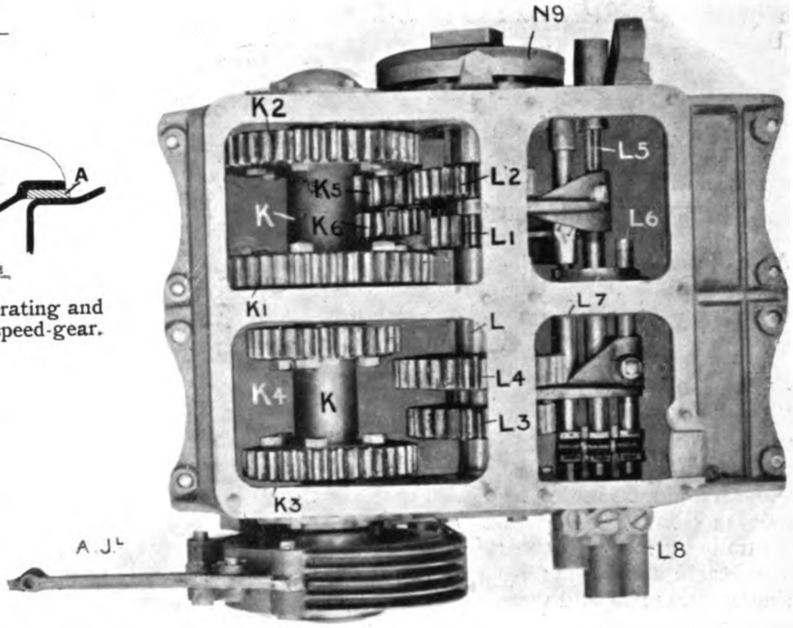


Fig. 15.—View of the "Austin" gear-box from above, with the inspection-cover removed.

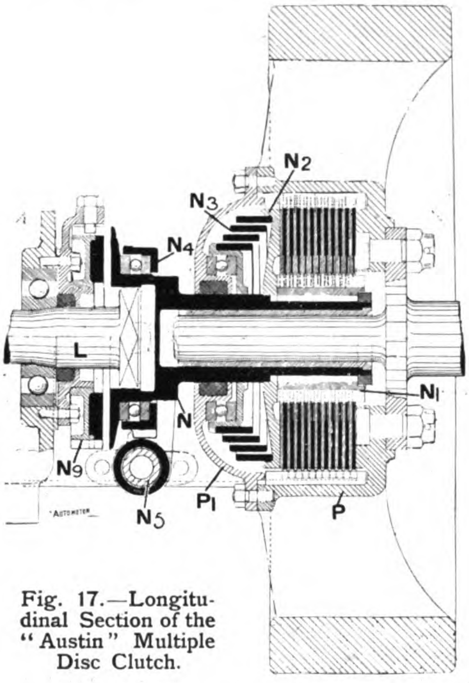


Fig. 17.—Longitudinal Section of the "Austin" Multiple Disc Clutch.

that the shoes are normally held clear of the brake-drum, G^5, by the spring, G^7. Acting against this spring, and therefore tending to adjust the brake, is the wing-nut, G^8, which lies in a very accessible position in the chassis. The brake-pedal, G^9, is of a similar shape to the clutch-pedal, N^7, and is visible in Fig. 17.

The Main-Clutch.

Referring to Fig. 17, which shows the clutch sectionally, it will be recognised that there are remarkably few moving parts for a multiple-disc clutch of this character. Floating freely upon the projecting end of the crank-shaft, and also free to move longitudinally, although engaging with the gear-shaft, L, is the specially-shaped sleeve, N, which may be regarded as the clutch-shaft. At its inner end, inside the hollow boss of the fly-wheel, P, it is fitted with a toothed spider, N^1, that carries the smaller set of discs, and also with a flange-casting, N^2, both of which are rendered rigid with it. These parts together form the sliding member of the clutch, and are normally forced forward towards the engine by the strong volute spring, N^3, which is interposed between the portion, N^2, and the cover-plate, P^1, of the fly-wheel.

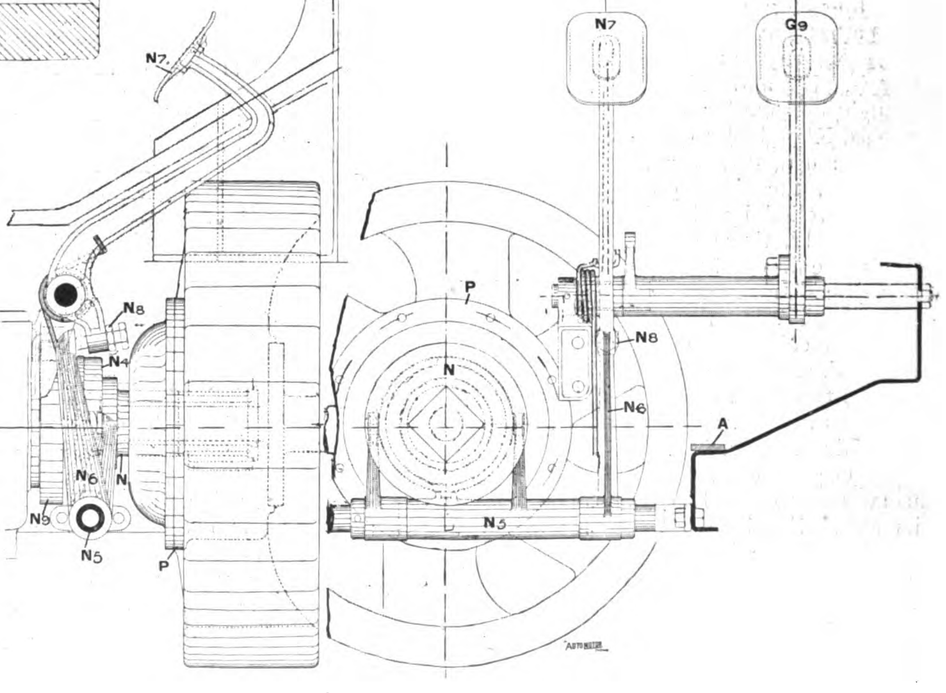


Fig. 18.—Side and front Elevations of the Clutch-operating Mechanism on the "Austin" Chassis.

The thrust of the spring against the cover-plate, P^1, is taken by a ball-bearing, and any leakage of oil between this cover-plate and the clutch-shaft, M, is prevented by a felt washer. The action of the volute spring, N^3, is to cause the casting, N^2, to force all the discs up closely together, for in between—and inter-meshing with—the inner discs, are a corresponding set of outer discs, which engage with inwardly-projecting teeth formed inside the boss of the fly-wheel. One set of discs is made of steel, and the other set of bronze, and it will be recognised that in this design they are allowed to have unusually wide friction surfaces.

For releasing the clutch—*i.e.*, for permitting the discs to free themselves from one another—the clutch-shaft, N^1, is drawn rearwardly by means of the ball-thrust-collar, N^4, which is mounted about it. This collar is in turn controlled from the clutch-pedal, N^7, by means of two lever arms that project upwardly from the rock-shaft beneath it. These arms (*see* Fig. 18, which shows the operating mechanism in side and front elevation) are connected by a sleeve with the longer lever, N^6, and it is with the end of this lever, N^6, that the clutch-pedal engages through the adjustable set-screw, N^8. When the pedal, N^7, is depressed, the thrust-collar, N^4, causes the clutch-shaft, N, to slide outwardly, and if the pedal is pressed down firmly the clutch-shaft is brought into contact with the stationary brake-ring, N^9, which is carried on the front of the gear-box. This brake, therefore, has the double effect of tending to cause the rings to separate and of slowing up the first-motion-shaft when changing gear. The brake-ring can be moved forward or backward to suit requirements; it is screwed into place, and can be locked in any position.

(*To be continued.*)

* * *

RACES, RECORDS, AND TRIALS.

Fernhurst Hill Climb.

No less than 68 entries were received by the Auto Cycle Club for their annual hill climb, which this year again took place in the grounds of Mr. F. S. Philipson-Stow's charming residence, Blackdown House, Fernhurst, near Haslemere. With few exceptions the competitors drove down from the London district, several of the tricars arriving at Haslemere Station somewhat late for the weighing-in. The bicycles were scaled at the motor garage at Blackdown House. The length of the hill is 1 mile, with an average gradient of 1 in 11, 380 yards of which is 1 in 8, and about 250 yards of 1 in 4½. The latter is at a point where there is also a sharp turning and this proved the undoing of many of the machines, which otherwise travelled well over the course. Barnes, Godfrey, and Bellinger all had nasty spills at this point, mainly due to their trying to take the corner too sharply. Fortunately no serious injuries resulted from these mishaps. At the instant of side-slipping in Bellinger's case, THE AUTOMOTOR JOURNAL photographer secured a "snap," which we reproduce this week. Considerable enthusiasm reigned during the running off of the events, which, commencing at 2 p.m., were so well managed as to be finished before 4 o'clock. Amongst the most interested spectators who followed the proceedings from the reserved enclosure, was the host of the day, Mr. Philipson-Stow. The officials who took part in this admirably-conducted and successful meeting were :—

Auto-Cycle Club Hill Climb at Fernhurst.—Mr. F. S. Philipson-Stow, whose grounds at Fernhurst were placed at the disposal of the Club for the day. Mr. Stow evinced the keenest interest in the whole of the day's proceedings.

Judges: Professor H. L. Callendar, Messrs. E. M. P. Boileau, J. Lyons Sampson, and Robert Todd.

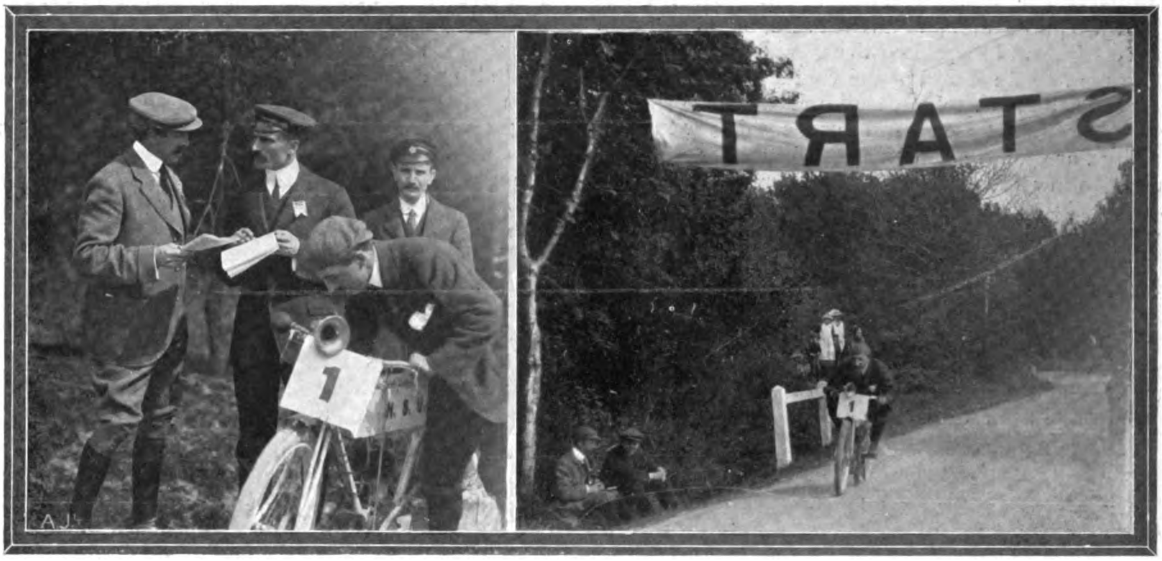
Marshals: Mr. S. F. Edge, Mr. J. W. Orde.

Timekeepers: Mr. A. V. Ebblewhite and Mr. F. Straight, the indefatigable Secretary of the Auto Cycle Club.

Stewards: Messrs. H. P. E. Harding, Q. O. Grogan, A. G. Reynolds, J. Thrupp, W. Craven, C. A. Smith, Lieutenant Hallowes, R.N.

The following is a complete list, with times, of those machines which reached the top of the hill :—

AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST.—Secretary F. Straight at his post for timing from the starting line.



AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST.—The commencement of the meeting. No. 1, Mr. E. W. Goslett and his 2¾ N.S.U. machine waiting to be despatched by Mr. J. W. Orde and Mr. S. F. Edge. In the right hand photograph Goslett is seen passing the point from which the actual timing was recorded.

Class I. Cyl. cap. up to 76 *by* 76 *mm.*—2 starters.—No award.

Class II. Cyl. cap. not exceeding 80 *by* 80 *mm.*—3 starters.—1. J. Marshall (3 h.p. Triumph), 2m. 17⅘s.

Class III. Cyl. cap. not exceeding 85 *by* 85 *mm.*—13 starters.—1. R. M. Brice (3½-h.p. Brown), 1m. 41⅘s.; 2. W. W. Genn (3½-h.p. Minerva), 1m. 45s.; 3. S. E. Rafferty (3¼-h.p. Kelecom), 2m. 0⅕s.; 4. F. Hulbert (3-h.p. Triumph), 2m. 10⅕s.; 5. S. Webb (3½-h.p. Quadrant), 2m. 26⅗s.

Class IV. Multi-cyl. engines.—9 starters.—1. D. Gilmour (6-h.p. J.A.P.), 1m. 40⅗s.; 2. D. Gilmour (8-h.p. Peugeot), 1m. 42s.; 3. W. H. Wells (5-h.p. Peugeot), 1m. 48⅕s.; 4. A. B. White (6-h.p. J.A.P.), 1m. 59s.; 5. H. C. Ebbutt (6 h.p. J.A.P.), 2m. 3⅘s.; 6. G. H. Tripp (6-h.p. J.A.P.), 2m. 12⅖s.

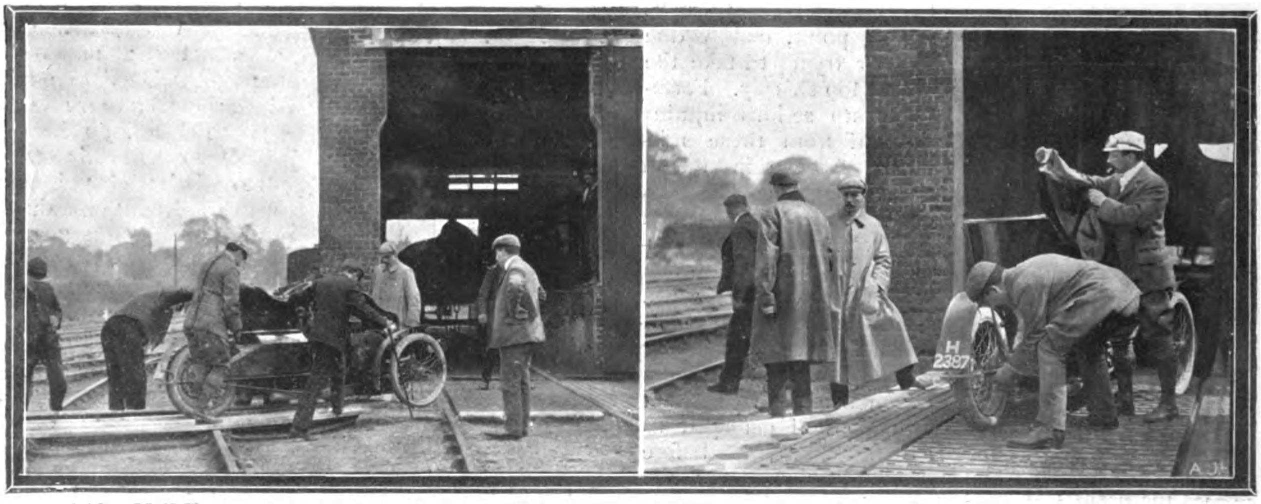
Class V. Any size engine.—9 starters.—1. R. M. Brice (3½-h.p. Brown), 1m. 42s.; 2. W. H. Wells (5-h.p. Vindec), 1m. 47⅖s.; 3. S. A. Ives (7-h.p. Lurquin-Coudert), 1m. 56⅘s.; 4. G. H. Tripp (6-h.p. J.A.P.), 2m. 16⅖s.; 5. W. Getting (5½-h.p. N.S.U.), 2m. 41⅕s.; 6. G. H. Tripp (4-h.p. Stevens), 3m. 11⅘s.

Class VI. Quads, tricars, &c. (2 passengers), cyl. cap. 85 *by* 85 *mm.*—To be fitted with variable gear, 1 starter.—No awards.

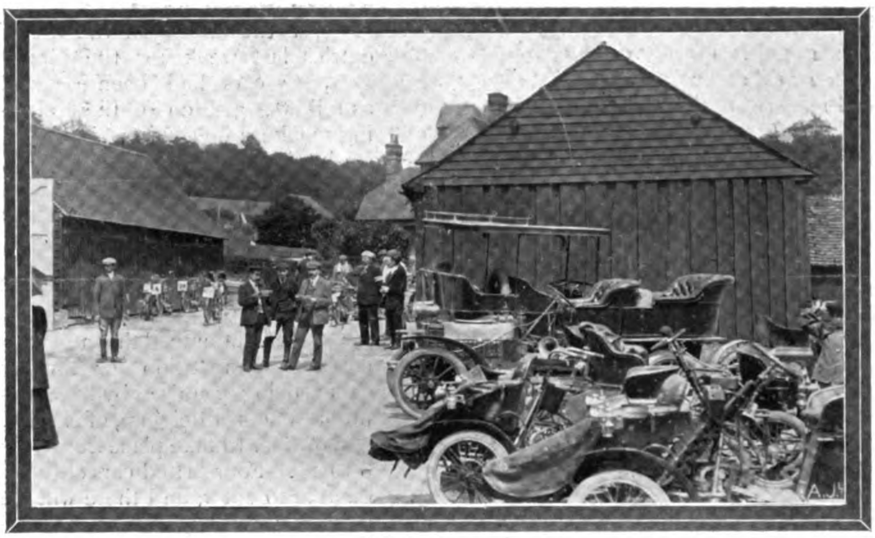
Class VII. Two-passenger quads, fore and side-cars, trailers.—Any size engine, fitted with variable gear, 9 starters.—1. A. J. Goldsworthy (9 h.p. Singer), 3m. 4⅖s.; 2. Wilbur Gunn (10-h.p. Lagonda), 3m. 9⅖s.; 3. J. Buckingham (10-h.p. Lagonda), 3m. 17⅕s.; 4. J. Browning (9-h.p. Riley), 3m. 29⅕s.; 5. E. C. Baker (10-h.p. Lagonda), 4m. 13⅕s.; 6. I. Van Hooydonk (7-h.p. Fafnir), 4m. 21⅗s.; 7. A. Clifford Earp (9-h.p. Singer), 4m. 29⅖s.

100 Miles "Non-Stop" Run.

UNDER the auspices of the Lincolnshire A.C., a "non-stop" run was carried out last Saturday. Each entrant started from his own residence, or some other selected point, all finishing at Lincoln between 4.30 and 5 p.m. Total time not to exceed 7 hours, minimum 5 hours; tyre stops up to 40 minutes allowed. Full complement of passengers were carried, including an observer. Fourteen started, 10 finished, 8 secured silver medals for "non-stops." These were: Mr. T. W. Mayes, Bourne, 15-h.p. De Dion; Mr. C. W. Pennell, 16-h.p Martini; Mr. H. Marshall, 12-h.p. Clement; Mr. A. A. Padley, 16-h.p. Humber; Captain Newsum, 30-h.p. Daimler; Mr. J. R. Richardson, 14-h.p. Mass; E. Garnett, 8-h.p. M.M.C.; W. B. Jevons, 10-h.p. Humber.



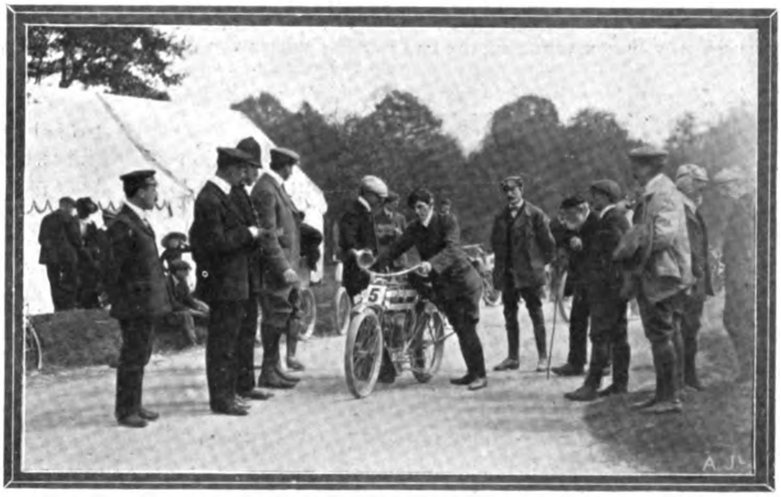
AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST, NEAR HASLEMERE.—Weighing the tri-cars at Haslemere Station. In the left picture the method of getting the machines over the railway metals may be seen, and in the right picture the official stamp, after weighing, is being affixed.



AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST.—The cars in the motor enclosure at Blackdown House.

Tourist Trophy Race.

At present the list of entrants for this important contest in the Isle of Man, taking place on September 27th next, totals up to 33, particulars of which have already been published in The Automotor Journal. Time is drawing near to the date for the closing of entries at the ordinary fee of £20 per car, viz., June 27th. After that date, up to and including August 27th, the fee will increase £2 per week, and on August 27th the lists close finally. The nature of this race is such that it should be the endeavour of all interested in the British industry to promote it in such a manner as to ensure its ultimately becoming *the* race of the year for the whole of Europe. That mere pounding away, without any definite or useful purpose, in a big scramble to be first from point to point over a huge course throughout Europe, is not particularly favoured, is evidenced by the small number of entries which have been forthcoming for the Circuit Européen. In fact, as we announce in this issue, there is every reason to suppose that the European Circuit will be postponed until next year, if not *sine die*. The Tourist Trophy Race, on the contrary, is probably the most scientific contest which has ever been devised, and is already having the effect of "improving the breed" of tourist cars. As the lessons of each year's contest are assimilated, it is likely ultimately to lead to the development of the most perfect form of automobile, and this, needless to say, is a result which it is the desire of both manufacturer and user to see accomplished.



AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST.—J. Marshall and his 3-h.p. Triumph waiting for the word to go.

AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST.—T. Read's 9-h.p. Singer.

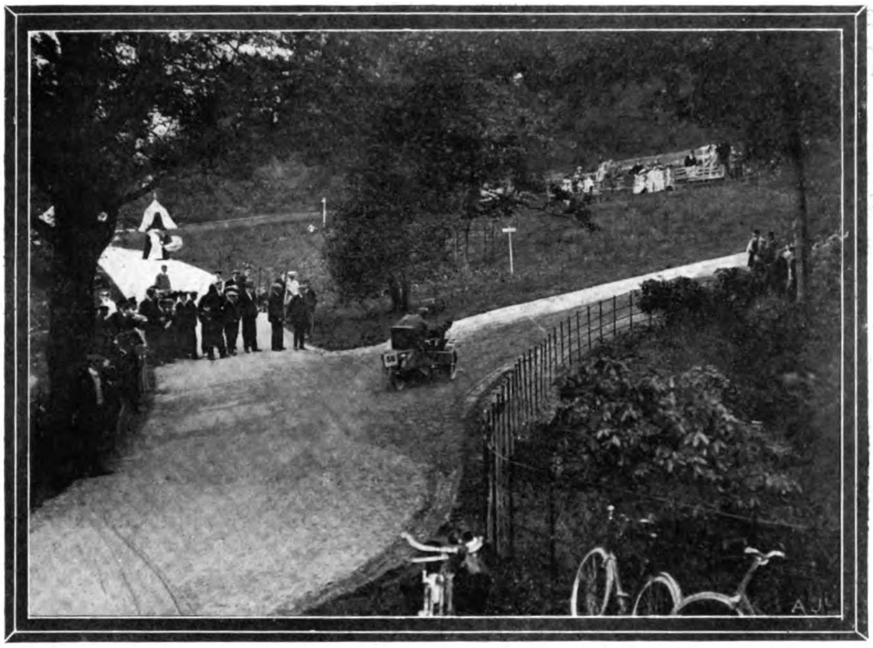
150 Miles "Non-Stop" Run.

The result of the competition for the Albert Brown Trophy, run off under the auspices of the Motor Cycling Club last Saturday, the governing rules for which were published in The Automotor Journal of last week, is as follows:—

Winner of the Trophy: Miss Agnes E. Wood, 40-h.p. 6-cylinder Napier; 2. J. A. Platt Betts, 6-h.p. Rover; 3. C. W. Brown, 8-h.p. Rover; 4. E. Perman, Belsize.

North of Ireland Hill Climb.

Minerva Motors, Limited, point out that in the report which appeared of the above meeting in our last issue, Major McCalmont's Minerva car, which headed the competitors in Class A, should have been given as a 16-h.p. and not a 40-h.p.



AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST.—A. Clifford Earp on the 9-h.p. Singer rounding the bad turning where the gradient is 1 in 4¼. Looking up the course.

Commercial Vehicle Trials, 1907.

PROGRESS is being made with the preparation of the regulations for the forthcoming Trials of Commercial Vehicles, for which purpose a joint committee of the A.C.G.B.I. and the Motor Van, Wagon, and Omnibus Users' Association are sitting. It is proposed that these Trials shall take place in February and March next, the entry list to be closed on November 30th. It is hoped that the regulations will be issued next month.

Laindon Hill-Climb and Brake-Test Competition.

THE result of the above competition is as follows:—

1. Mr. J. Gurney Fowler, 24-h.p. Panhard; 2. Capt. J. R. B. Newman, 18-h.p. Mercedes.

Circuit Européen.

IT is officially announced that the A.C. de France have received a communication from the German Automobile Club requesting that the European Circuit shall be postponed until a later date. The matter has been considered by the Sporting Commission of the French Club, and they have decided that the question of the postponement of this event must be settled by the International Executive Committee, to whom they have referred it. The general feeling, however, appears to be in favour of acceding to the suggestion of the German Club, no doubt the very sparse number of entries having considerable weight in this respect. In all probability if the race is postponed it will be until 1907.

French Grand Prix.

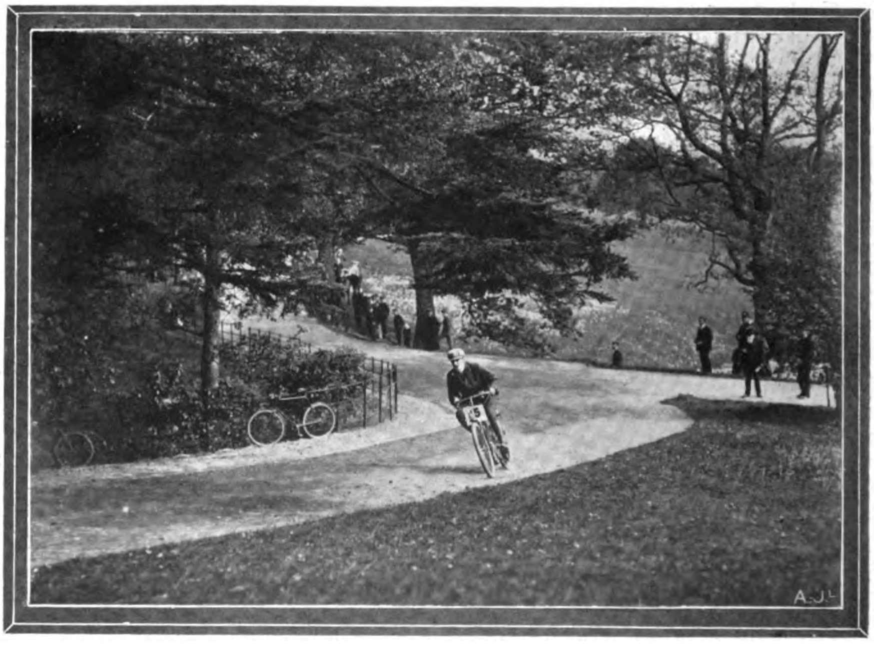
AT the closing of the list of entries last week for the Grand Prix, 34 cars had been entered as follows, 3 each of the following makes:—Darracq, Panhard, Richard-Brasier, Lorraine-Dietrich, Renault, Hotchkiss, Itala, Fiat, Bayard-Clement, Mercedes, and 2 Gregoires, 1 Gobron, and 1 Vulpes.

Belgian International Tourist Car Trial.

IT is announced that an International competition for touring cars is being organised by the automobile clubs of Belgium, of Namur, and of Spa, to take place from July 8 to 16. Four-seated cars only are eligible to enter, and these will be divided into four classes, according to piston area. There will be six stages, starting from Spa, and finishing at Dinant, the following countries during these stages being visited:—(1) Belgium, (2) Holland, (3) Germany, (4) Luxembourg, (5) France, as far as Rheims. The cars will be controlled at starting and finishing of each stage, and on the last stage but one a long distance speed contest will take place over a distance of 104 kilometres.

Graphic Trophy Race.

IF possible the race for this trophy will take place in the Isle of Man on September 28th next, this being the day following the International Tourist Trophy Race.



AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST.—L. W. Bellinger on his 3½-h.p. Quadrant coming round the dangerous bend. Looking down the hill. One-tenth of a second later Bellinger had a very sharp side-slip, the moment of our photograph showing the actual commencement of the slip.

AUTO-CYCLE CLUB HILL CLIMB AT FERNHURST.—The finishing point.

Inter-Club Hill Climb at Oakamoor.

On Saturday last, for the third year in succession, at the invitation of Mr. Francis A. Bolton, J.P., one of the vice-presidents, the members of the Derby and District A.C. had a most enjoyable run to Moor Court, Oakamoor, Staffs. In order to add to the attractiveness of the meeting, Mr. Bolton had, on this occasion, very kindly extended his invitation to the members of the Nottingham and Leicester Clubs, and offered a very handsome Silver Cup for the winner of an inter-club hill climb, which was contested by four representatives of each of the four clubs. Soon after 2 o'clock the cars began to arrive in great numbers, and were formed up on the cross roads at the top of "Star Hill," the site chosen for the competition, from whence an excellent view could be obtained of the finishing point, and shortly afterwards the trials commenced. The teams chosen were as follows :—

Derby.—E. H. Joule, 15-h.p. Darracq ; F. Smith, 16–20-h.p Rover ; G. F. Reading, 10-h.p. Wolseley ; C. R. Hewitt, 8–10-h.p. Humber.

Nottingham.—M. Ross-Browne, 40–50-h.p. Richard-Brasier ; E. W. Wells, 30–40-h.p. Daimler ; J. Gaskin, 16–20-h.p. Argyll ; H. Belcher, 16–20-h.p. Humber.

Leicester. — H. Byron, 20-h.p. Rolls-Royce ; J. Harpur, 16–20-h.p. Humber ; H. B. Boreham, 10–12-h.p. Darracq ; — Doran, 22-h.p. Minerva.

The timing arrangements were on the lines instituted by the Derby Club, and resulted in some very close and exciting finishes. The heats in which Mr. Wells beat Mr. Harpur, and H. Belcher beat F. Smith, being particularly well contested. The actual results were as follows :—

FIRST ROUND.

E. W. Wells (scratch) beat J. Harpur, with 1 min. 31 secs. start, in 2 mins.

E. H. Joule, with 39 secs. start, beat H. Boreham in 4 mins. 38 secs.

H. Belcher (scratch) beat F. Smith, with 9 secs. start, in 3 mins

Doran, with 15 secs. start, beat Gaskin in 3 mins. 8 secs.

G. F. Reading, with 2 mins. 41 secs. start, beat W. Ross-Browne in 4 mins. 37 secs.

C. R. Hewitt, with 3 mins. 39 secs. start, beat H. Byron in 6 mins. 6 secs.

F. Smith and J. Harpur, the two best losers, passed into second round to avoid a bye.

SECOND ROUND.

G. F. Reading, with 2 mins. 37 secs. start, beat E. W. Wells in 4 mins. 36 secs.

H. Belcher (scratch), in 2 mins. 40 secs., beat E. H. Joule, who took 1 min. 38 secs. start.

Doran (scratch), in 2 mins. 58 secs., beat Hewitt, taking 2 mins. 58 secs.

F. Smith (scratch), in 3 mins. 7 secs., beat J. Harpur, taking 19 secs.

THIRD ROUND.

G. F. Reading, with 1 min. 56 secs. start, beat Belcher (scratch) in 4 mins. 20 secs.

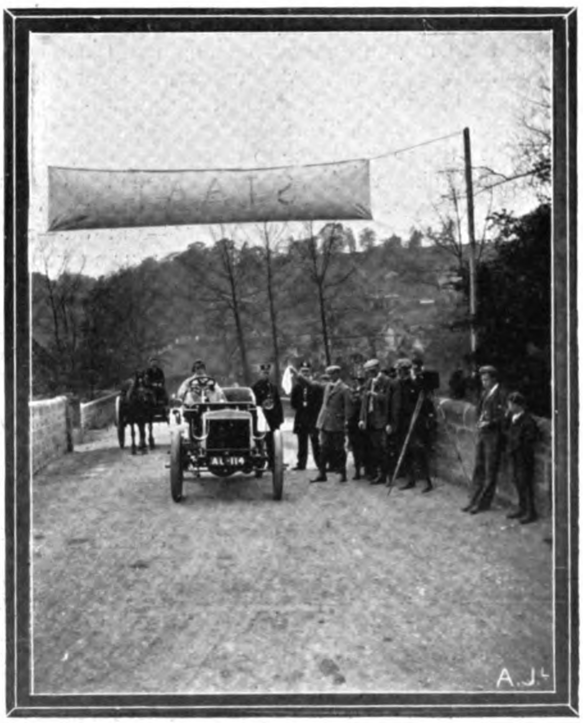
Doran (scratch), in 3 mins. 24 secs., beat F. Smith, with 9 secs. start.

FINAL.

Doran (scratch), in 2 mins. 54 secs., beat Reading, with 1 min. 22 secs. start.

The course, which is singularly picturesque, was admirably kept by a special staff of police, who were aided in their efforts by the officials of the various clubs. The Derby Club had lent their field telephones for the occasion (which had been laid down earlier in the day by Mr. C. T. Leech, hon. treasurer, and Mr. C. J. Allin, hon. sec., assisted by Mr. Bolton's staff), and these proved of the greatest service in expeditiously starting and timing the cars. Mr. A. Barlow (Notts.) acted as starter, and the times were taken by Mr. C. J. Allin (hon. sec. Derby A.C.), while Mr. F. A. Bolton acted as judge.

Subsequently an adjournment was made to Moor Court, the residence of Mr. F. A. Bolton, where a sumptuous repast was ready. Mr. Bolton and his staff were unremitting in their attention to the comfort of the visitors—some 200—and, with a few well-chosen remarks, the host afterwards presented the cup to the winner.



HILL CLIMB AT OAKAMOOR.—The starting point at the Inter-Club Hill Climb which took place last week at Mr. Bolton's mansion at Oakamoor. The car about to be started is Mr. J. C. Wilson's 28-35-h.p. Daimler, driven by himself, Mr. F. A. Bolton is ready with the starting handkerchief, Mr. C. T. Leech (Hon. Treasurer) is with watch in hand, and Mr. C. J. Allin, the Hon. Secretary, is at the telephone.

AMERICAN TWO-GALLON EFFICIENCY TEST.—The Franklin Car (air-cooled) passing other cars already run out of fuel. The Lozier is "dead" on the left.

Two-Gallon Efficiency Test.

THE particulars of the results of the above contest, held in America, under the auspices of the A.C. of America, which we have published in the last two issues of THE AUTOMOTOR JOURNAL, are now confirmed by mail, both in regard to the original contest in which the Franklin and Frayer-Miller headed the list of competitors, and also in respect to the re-running of the contest under the same conditions by these two cars, having regard to the somewhat surprising distance which they respectively covered in the first instance. The result of the second test was that both very largely bettered their times, the former being credited with 95 miles on the 2 gallons, and the Frayer-Miller 59·8 miles from the start. Altogether 67 cars started, the mileage covered ranging down to under 16 miles for the 2 gallons. Although at first sight it might be concluded that this event was of a somewhat similar character to the British Tourist Trophy race, there is, in reality, but little resemblance to that well-conceived contest. No stipulations were, for instance, made as to the size, type, power, or carrying capacity of the competing cars, and consequently a tricar could—and did—compete against a char-a-banc and a 40-h.p. touring vehicle. No record was, moreover, made of the speeds attained. It is, indeed, difficult to see the utility of such a contest. Success or failure depended solely upon happening to conform most nearly with the following formula :—Marks (score) = weight of loaded car in lbs., *plus* 800 (constant) multiplied by distance (in miles) travelled while consuming 2 gallons of petrol. The only modification of this formula was in the case of 2-cylinder or single-cylinder vehicles, which were handicapped to the extent of taking 25 per cent. and 30 per cent. respectively off their actual loaded weights when calculating their marks.

Vienna-Gratz-Vienna.

ON May 12th and 13th, this German Reliability Trial was run off, starting from Vienna, the total distance of the run being 410 kiloms.; 26 cars started in the two categories, these being divided into single-cylinder and 2-cylinder cars. The results are :—

CAT. I.—*Single Cylinder Voiturettes.*

1. 9-h.p. De Dion-Bouton.
2. 8-h.p. De Dion-Bouton.
3. 8-h.p. Opel-Darracq.
4. 8-h.p. De Dion-Bouton.
5. 7-h.p. Maurier-Union.
6. 6½-h.p. Peugeot.

CAT. II.—*Two-Cylinder Voiturettes.*

1. 10-h.p. Peugeot.
2. 10-h.p. De Dion.
3. 8-h.p. Lorraine-Clement.
4. 8–10-h.p. Bayard-Clement.
5. 10–12-h.p. Opel-Darracq.
6. 10-12-h.p. Bayard-Clement.

AMERICAN TWO-GALLON EFFICIENCY TEST.—The Frayer-Miller air-cooled car waiting the arrival of the officials to have distance taken and be released for returning home.

Speed-Judging Competition.

THE North London Automobile Club and the Southern Motor Club held a speed-judging competition on Saturday last for the "Gamage Cup." Each club provided a team of six cars, and previous to starting each driver drew a ticket showing the rate of speed at which he was to travel. The route was a cross country one, starting and finishing at the Berkeley Arms, Cranford Bridge, and passing through Bedfont, Feltham, and Hutton. The distance was 8 miles. The result was a win for the Southern Motor Club by 1,037 yards. Mr. J. H. Burley, N.C.U., acted as official timekeeper. The details of the run are as follows:—

Car No.	Rate Drawn to Travel.	Rate Actually Travelled.		Amount of Error in Judgment.	
		Southern Motor Club.			
	m.p.h.	mls.	yds.	mls.	yds.
L.C. 1512 ...	14	15	340	1	340
A.N. 26 ..	16	17	505	1	505
L.C. 3669 ...	19	20	1,135	1	1,135
A.M. 776 ...	15	18	260	3	260
B.Y. 352 ..	18	20	1,162	2	1,162
D.L. 146 ...	17	20	1,557	3	1,557
		Aggregate Error		13	1,439
		North London.			
L.C. 3671 ...	16	17	505	1	505
H. 2339 ..	19	20	1,065	1	1,065
H. 880 ...	17	19	262	2	262
H. 1647 ..	18	20	346	2	346
H. 359 ...	15	18	938	3	938
H. 1111 ...	14	17	1,120	3	1,120
		Aggregate Error		14	716

	Mls.	Yds.
North London	14	716
Southern	13	1,439
		1,037

Herkomer Cup.

PERSISTENT rumours are about on the Continent that the German Emperor will in all probability witness the passing of the cars in this contest should his visit to to Vienna synchronise with the date of the cars reaching that city, the Austrian A.C. possibly being honoured on that day by the Emperor's presence at *déjeuner.*

50 Miles Consumption Trial.

THE Hertfordshire County A.C. held their 50 Miles Consumption Trial on Saturday last. The event, favoured with fine weather and good roads, was an unqualified success. The start was made well to time from the club's headquarters, the Red Lion Hotel, Hatfield, the route being to Biggleswade and back *viâ* Hitchin. The judges were Messrs. D. Corse Glen and W. Whittall. The following are the official results:—

Car and Driver.	Weight.	Consumption.	
		Total	per ton mile.
Car Class.			
	tons.	gals.	gal.
1. 22-h.p. Sunbeam (Mrs. Woodhouse) ...	1·5	1·525	·0203
2. 40-h.p. Napier (Mr. Cecil Edge) ...	2·1	2·268	·0216
3. 12-h.p. De Dion (Mr. W. H. Colliver)	1·35	2.0	·0296
4. 9-h.p. M.M.C. (Mr. H. R. Hickman)...	0·95	1·456	·0306
5. 12-h.p, Argyll (Mr. T. Hooydonk) ...	1·25	2·025	·0324
6. 14-h.p. Marples-Huber (Mr. S. Marples)	1·225	2·150	·0350
Motor Cycle Class.			
1. 3½-h.p. Quadrant (Rev. A. J. McKinney)	0·15	·0531	·0708

The Marples-Huber went about four miles out of the way, through the driver mistaking the road.

Mr. H. L. Gibbs, on a 3½-h.p. Quadrant, also started, but had to give up owing to the sparking advance lever breaking.

Marseilles 500 Metre Hill Climb.

CHIEF results in this annual French event (third year) over 500 metres on Platrieres Hill near Aix, are as follows:—

Light Motor Bicycles.—1. Motosacoche, 50 secs.

One-Third Litre Motor Bicycles.—1. Magali, 56⅕ secs.; 2. Buchet, 59⅘ secs.; 3. Buchet, 1 min. 6 secs.

5-*h.p. Tricars.*—1. Stimula-Buchet, 1 min. 23⅕ secs.

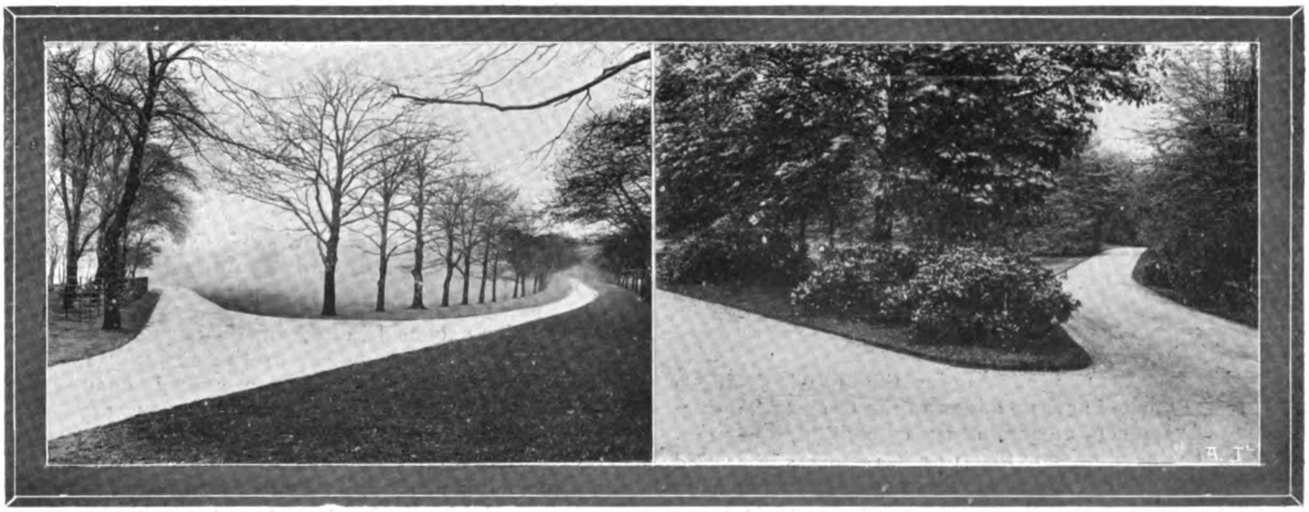
Voiturettes complete up to 3,000 *Francs.*—1. Lacoste-Battmann, 1 min. 52 secs.; 2. Fouillaron, 2 mins. 8⅘ secs.

6,001 *to* 8,000 *Francs Chassis.*—1. Motobloc, 1 min. 22⅗ secs.; 2. De Dion, 1 min. 25 secs.; 3. Brasier, 2 min. 1⅕ secs.

8,001 *to* 12,000 *Francs Chassis.*—1. Mieusset, 57⅗ secs.; 2. La Buire, 1 min. 1 sec.; 3. Mieusset, 1 min. 22⅗ secs.

12,001 *to* 16,000 *Francs Chassis.*—1. Berliet, 49⅗ secs.; 2. Fiat, 50⅗ secs.; 3. Rochet-Schneider, 1 min. 1 sec.

16,001 *to* 22,000 *Francs Chassis.*—1. Berliet, 37 secs. (best time of the day); 2. Fiat, 47⅗ secs.



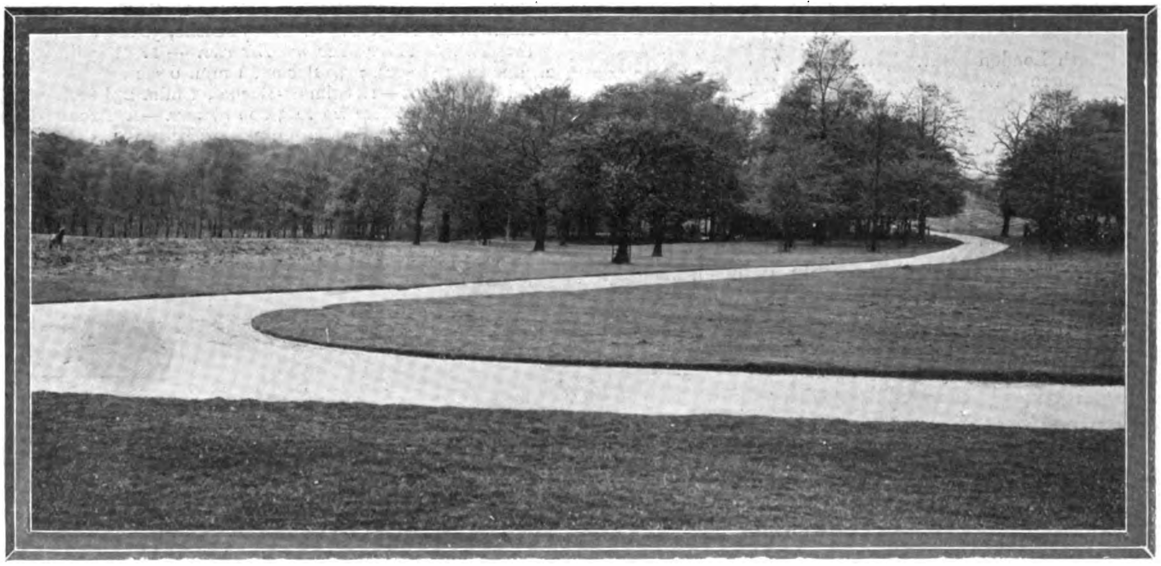
INTERNATIONAL CUP RACE FOR MOTOR CYCLES.—Above, we are able to give photographs of the road in Knowsley Park, Lancashire, where it is proposed to run off the Selection Trials for the International Cup Race, and to run the "Motor" Cup Race. The two pictures shown are two of the bad corners on the course.

MOTOR CYCLING.

INTERNATIONAL CUP RACE FOR MOTOR CYCLES.—A couple of the straight stretches. On the left is a view near the keeper's house; on the right, the Coach road about half-way along, looking down.

International Cup.

THE British eliminating trials for the International Motor Cycle Cup have been fixed for Wednesday, June 6th. By permission of Lord Derby, the trials will take place in Knowsley Park, where a good course of four and a half miles, with some fairly severe gradients, has been mapped out. The competitors will have to make 27 circuits (about 120 miles), starting at 9 a.m., and no times will be taken after 1 p.m. Subsequently, however, there will be a speed trial over a four miles stretch. The following entries have been received:—H. A. Collier, 7-h.p. Matchless; C. R. Collier, 7-h.p. Matchless; G. A. Barnes, 8-h.p. Barnes; C. B. Franklin, 7-h.p. J.A.P.; T. Silver, 6-h.p. Quadrant; V. Feeney, 7-h.p. Westlake; R. Marewood, 6-h.p. Westlake.



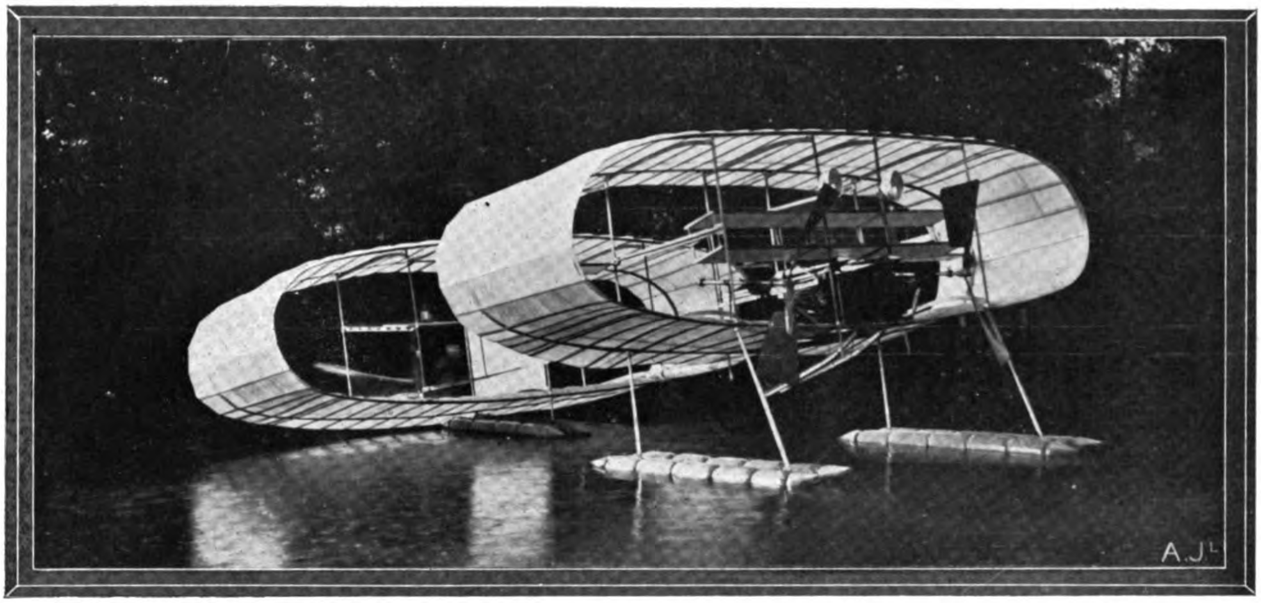
INTERNATIONAL CUP RACE FOR MOTOR CYCLES.—Prescott Lodge Corner.

* * * *

The C.T.C. and Motorists.

MOTORISTS may now enjoy the privilege, if so minded, of becoming members of the Cyclists' Touring Club. At a recent meeting of the council, held in Edinburgh, it was announced that 12,726 members had voted upon the question "Are you in favour of steps being taken to broaden the basis of the club, so as to admit all tourists to membership?" The result of the voting was that 10,495 decided in favour of the proposal, and 2,231 against. The consideration of the necessary steps to be taken to give effect to the majority in this respect has been referred to a special committee. Of course, to all practical intents and purposes, the "tourists, other than cyclists," means automobile tourists. Whether, considering that these latter have the Club and the Motor Union to join if they desire to do so, they will obtain any additional advantages from becoming members of the Cyclists' Club is a point on which many of them are likely to entertain doubts.

AERONAUTICS.



The Aeroplane of Messrs. Bleriot and Voisin on Lake Enghien.

Divergent Balloons.

THE performances of the two balloons—the "Dolce far Niente" and the "Aero Club II."—that went up from the Wandsworth Gas Works on Friday in last week, were notable from the light they threw on the variability of atmospheric currents, and the extent to which advantage might be taken of them, even by ordinary balloons for varying the journeys which they perform. Of the two balloons to which we refer, which ascended in rapid succession at the same place, one found its way to Ashford and the other came down on Chobham Common. We happened to enjoy an opportunity of observing the final performances of the latter. Passing over Weybridge, it was rapidly descending to earth, and crossed the Wey Navigation Canal so low down that the car only just missed the tops of the trees on either side. The "man at the helm," however, at that moment threw out a large quantity of ballast, and the balloon then made a magnificent jump at a high rate of speed to an altitude of what appeared to be a couple of miles, and was actually some 7,000 feet. Here the vagaries of the air currents were again brought prominently into evidence. For some minutes the balloon found itself in a current setting in almost the opposite direction to that by which it had come, and which accordingly carried it away some distance to the northward, when, again sinking, it encountered the original current, and ultimately came to land in the direction of Chobham. During these evolutions of the balloon, we had the opportunity of observing a very extraordinary, if not quite unique, effect. The balloon drifted straight across the disc of the sun, which for a few minutes was unobscured by clouds. The round black ball with the car depending from it was silhouetted with extraordinary sharpness against the radiance behind it, and the diffraction effect came into full play, causing the round black circle of the balloon to appear enclosed in shooting fire, resembling to some extent the solar corona. Clouds then passed across both sun and balloon, but for a long time the course of the latter could be followed (though it was itself invisible) by the dead black circular shadow it projected far beneath it. Both the balloons had lady passengers, the "Dolce far Niente" carrying Mrs. Harold Gould, together with Mr. Frank Butler, Lord Royston, and Professor Huntington, "Aero Club II." having as passengers the Hon. Mrs. Harbord, Count Biron, Mr. C. F. Pollock, and Mr. W. Hall of the American Aero Club.

The Effect of High Altitudes on Eyesight.

DR. ROBERT DAULNOY, a Paris eye specialist, claims to have made the discovery that the sense of vision at high altitudes becomes amazingly sharpened, and concludes that certain methods of dealing with ocular defects might have greatly improved results if carried out when high up in the air. The experiment on which the Professor based this conclusion was that when travelling over a lake at an altitude of 6,000 feet he threw a bottle overboard, and that he and all the other passengers were able to clearly observe it all the way till it dived beneath the surface of the water. Presumably the Professor assured himself that there were no boats on the lake, but it is to be hoped that he will not make a practice when he goes ballooning of hurling such "bolts from the blue" upon his fellow mortals, otherwise it will be not merely ocular operations that will be needed.

The Bleriot and Voisin Aeroplane.

WE are this week enabled to reproduce a photograph of the Bleriot-Voisin aeroplane as it appears, if not in the air at any rate on the water. It has been described abroad as on the Chanute principle, but this, it will be at once observed, is a description that hardly fits it, as it has two pairs of super-posed aeroplanes, which are connected one in front of the other, as in M. Archdeacon's machine, which has not yet proved satisfactory. The Voisin machine, it will be noted, differs from the Archdeacon also in having the ends of the aeroplanes bent round to meet one another, so that the lifting surfaces really form a species of loop, an arrangement which obviously reduces the lifting power of the lower surfaces. The aeroplanes are mounted on floats of hollow tubular construction, the object of the whole arrangement evidently being to get up speed on the water sufficient to enable the machine to rise in the air, while the floats will keep it from sinking when it comes down again, provided only it comes down feet foremost, which, from the look of things, is by no means a foregone conclusion. The aeronaut is supposed to lie horizontally on a plank in front of the motor. Frankly we do not believe the machine has ever risen from the water at all. It has been, it is said, tried on the Lake of Enghien, but we do not understand that it soared from the surface. The total span of the machine is 6 metres, the aeroplanes having a width of 1½ metres, and the total surface being 60 square metres. The propellers are driven by an 8-cyl. 24-h.p. "Antoinette" engine, at 600 revs. per min.

The Grand Prix d'Aviation.

IN addition to M. Santos Dumont and M. Florencie, who are announced to have given in their names as competitors for the 50,000 franc Deutsch Archdeacon Prize, another competitor has now come forward in the person of M. Bellamy. M. Florencie expects to have his machine ready in a few days, and it is announced that M. Santos Dumont is about to try the motor which he is to use in his "helicoptere" attached to his little navigable balloon, No. 14.

An Historic Balloon Reproduced.

THE military authorities of the first French Republic were nothing if not progressive, and it is of interest to call to mind that one of the early victories which crowned their arms, the battle of Fleurus in 1794, was rendered memorable by being the first occasion in which a captive balloon was ever used for military scouting purposes. There are to be great doings at the beginning of May at Charleroi, the Belgian factory town, which is close to the scene of the great battle, and the amusement committee are adding to the attractions by having an exact reproduction made and sent up of the Fleurus balloon of 112 years ago.

* * * *

MOTOR BOATING.

Motor Yacht Club.

WE learn that a new secretary has now taken over the duties in connection with the Motor Yacht Club, and that there is likely to be considerable energy introduced into the working of the club events for the coming season. The new secretary is Mr. W. J. Fernie, who is distinguished in several directions. Mr. Fernie stroked the Cambridge boat in 1896 and 1897, and he has done a lot of yachting and at one time owned an 80-tonner, whilst his experience with motors has been considerable. During the late South African war he served as a volunteer in Africa and organised "Fernie's Scouts." He also had charge of a district which he specially cleared of rebels, and at present he holds rank as a Lieutenant in the Naval Volunteers, with which arm of the service he has carried out a lot of good work on the "Buzzard." For the last year or two he has been at Lloyd's, so that taken all round Mr. Fernie's wide experience should be just the right sort that is required to help forward the Motor Yacht Club. He is, moreover, very keen on the subject of marine motoring, and has very practical knowledge in the organisation of yacht races.

The Cruise of "Napier Major."

FROM Inverness Mr. Hearman, who is in charge of "Napier Major" on her long cruise, sends a few particulars of his adventurous voyage:—

"I wired you this morning as soon as we arrived, and as all hands were completely knocked up, and the boat wet through from top to bottom, I came through into the Canal Basin, and moored up, brought all the blankets and bedding ashore to get dried, took rooms in a hotel here, and all hands turned in for some sleep.

"We have had a very bad passage from Flamborough Head northwards; it has either been thick fog or heavy weather from the N.E. My steering compass went wrong, and I had to put into Blyth to get it put right, and in any case the fog was too thick to proceed, and we had a gale off the Firth of Forth, and again last night in the Moray Forth.

"I never left the deck all last night, and was chilled right through, and completely worn out on my arrival here. The 'Napier Major' behaved splendidly through it all, and the engine never gave the slightest trouble. She is a grand boat. The wind was on the after quarter last night, fortunately, and I had to come right through, as Inverness was the only port I could make with safety."

Yarrow-Napier Torpedo Boat.

IN our issue of January 27th, this year, we described the first motor torpedo boat built by Messrs. Yarrow. We have now received from Mr. S. F. Edge the following account of her first sea trip, all previous trials having been conducted in sheltered waters:—"Starting from their works at 7.50 a.m. a good run was made down to Long Reach, where forty minutes was spent in swinging the boat and getting the compasses adjusted. A run was then made to Gravesend, where the compass adjuster was landed at 9.15, and then she was headed for the open sea through the Prince's Channel. A fair amount of sea was encountered outside, but beyond scattering the spray, she was very little affected by the roll, and behaved admirably in a beam sea. Dover was reached at 12.8. A turn was made inside the harbour, and she was then headed for home again.

"The times on the return journey were—Gravesend 3.5 p.m., and Yarrow's Yard, 3.46 p.m. The total distance covered was 176 knots, equal to 202 miles, and the net time taken 7 hours 11 minutes, which gave a mean speed of 24·5 knots, or 28·12 miles per hour right through. The engines ran like a clock from start to finish, and were never stopped the whole time. The petrol consumption during the whole run was 220 gallons, and as the boat can carry 350, this would enable her to cover a distance of 321 miles at full speed."

Marine Motor Association.

THE Council of the Association have decided to fix the measuring districts, for each of which a local measurer will be appointed, at present as follows, the Council reserving the right to alter or extend the districts in the future as may be necessary:—1. London and Thames from Dover to Oxford, including Southend; 2. Burnham-on-Crouch; 3. Norfolk and Suffolk, including Harwich; 4. Solent district, including Isle of Wight; 5. Plymouth and Dartmouth District; 6. Bristol Channel district; 7. Liverpool district and North Wales; 8. Belfast Lough; 9. Firth of Clyde. A special general meeting will be called at an early date to decide among other matters the question of measurement fees under the new arrangements.

THE ELECTROBUS FLOTATION.

NOTHING could, we think, more fully justify the strong attitude that we adopted in connection with the Electrobus flotation than the circular which has now (under date of May 16th) been issued by the secretary of that company to those who applied for shares. This precious document speaks for itself, and we therefore reproduce it in full below. The reports referred to in it also throw a considerable amount of additional light on certain matters of importance, and appear to still further emphasise the lack of accuracy of the prospectus. Thus, for instance, the report made by Mr. Frank Broadbent, M I.E.E., M.N.E.C. Inst. E. and S., contains the following passages:—"I have also perused the maintenance *proposal* of the E.P.S. Company, and the *draft* agreement of the Gratze Syndicate. As to the batteries, the Gratze battery is more or less in the experimental stage, and so far as I could gather *no batteries on this principle have been made for electric power work*, but, so far, merely for ignition batteries. There is, therefore, a certain amount of speculation in connection with the proposal to use this battery. The X battery, on the other hand, has been used considerably for electromobile work, and, in my opinion, is quite suitable for such work." The italics are ours.

Mr. Broadbent's concluding sentence is even more significant. It runs thus:—"I note that the quotations you have had for *maintenance*, apart from the Gratze quotation, are for 4*d.* per car-mile. This, in my opinion, is a very reasonable quotation, and my opinion is that, *if* the total costs of the batteries, including maintenance and all charging costs, and all labour in connection with the batteries, does not exceed 6*d.* per car-mile, you could, with good management, successfully compete with the petrol motor-'bus traction." Again, the italics are ours. Concerning the other reports that were enclosed with, and were referred to in the circular, it is perhaps kindest to pass over them without comment.

The Electrobus Company's circular, over the signature of the secretary, says: —

> IT was hardly to be expected that the project of placing electric 'buses on the London streets would pass uncriticised, if for no other reason than that it seriously threatens the interests of all who have moneys at stake in petrol or other 'buses. The directors believe that fear of the consequences to such interests of the advent of the electric 'bus may be rightly regarded as the origin of some at least of the attacks to which this Company, its project, and prospectus have been subjected.
>
> With regard to the prospectus, it has been said that it contains mis-statements as to, and concealment of, material facts, and as to the project that it cannot be commercially successful. The directors, while maintaining that all concerned in the issue of the prospectus have acted with perfect good faith, recognise that the statements appearing therein, as to the patent rights giving the monopoly of electric 'buses of the type which the Company intends to purchase, cannot be substantiated in the event of the opinion hereinafter referred to being upheld, and consequently that shareholders who claim to withdraw on the ground of having been misled by the prospectus should be afforded the opportunity of so doing.
>
> Since the issue of the prospectus, the validity of Letters Patent No. 3,653 of 1902, under which the Company, by virtue of the contract (No. 2 in the prospectus) of the 19th April, 1906, acquired the right to call for a licence, has been questioned. The patent relates to what are claimed to be improvements in motor road vehicles, whether electrically driven or not. These improvements have no reference to the accumulator or motor, but are concerned with the driving and gearing mechanism made use of in the construction of 'buses of the type which the Company proposes to run. An expert opinion has now been obtained as to the validity of the patent, and such opinion is unfavourable. Accordingly, the directors have made arrangements, subject to the approval of the shareholders at the statutory meeting, by which the vendors' agreement above mentioned (No. 2 in the prospectus) shall be cancelled.
>
> As the probability of the success of the Company's project from its commercial aspect has been called in question, the directors have, since the issue of the prospectus, taken further expert opinion upon the matter. Copies of the reports of Mr. Frank Broadbent, M.Inst.E.E., M.N.E.C.Inst.E. and S., Consulting and Inspecting Electrical Engineer, Mr. Henry F. Joel, A.M.I.C.E., Electrical Engineer and Expert in Electromobile Traction, and an extract from the report of M. Robert Lacau, Consulting Engineer, of Paris, together with the Press notices which appeared prior to the issue of the prospectus, are enclosed, and the directors request your careful perusal of same.
>
> The items for tyres and accumulators in the estimated cost of running the 'buses have also been questioned, it being said that these are placed too low. As set forth in the prospectus, these items were determined by maintenance mileage contracts offered to the Company; but it should be borne in mind that the estimates contained in the prospectus were based on the running of 300 'buses.
>
> The underwriting contract referred to in the prospectus has been taken over by the Company, who will therefore pay the underwriting commission at the rate specified in the prospectus of £5 per cent. in cash on 50,000 £1 ordinary shares.
>
> At the time of the first allotment of shares subscriptions in excess of the minimum amount had been received by the directors, and an amount in excess of the application moneys payable in respect of such subscription was credited to the Company by their bankers, but cheques to the amount of such application moneys had not then been cleared. It has been suggested that the allotment was therefore not in compliance with Section 4 of the Companies Act of 1900. The directors have taken counsel's opinion, and are advised that the point is a doubtful one, and can only be settled by a legal decision. If the allotment was not good, it is voidable by any applicant within one month of the statutory meeting. The directors think it right to put the full facts in this respect before the shareholders.
>
> The directors believe that in the Electrobus lies the immediate solution of the passenger street traffic problem in the Metropolis, and that the 'buses intended to be acquired and run by the Company will be fully capable of efficiently performing the work required of them, and that this Company will, therefore, be the practical pioneer of electrical passenger traffic in London.
>
> The directors hope that, notwithstanding the opposition, a sufficient number of shareholders will remain with the Company. They, however, have no wish that any shareholder shall remain in the Company who does not so desire, and they, therefore, request that any shareholders who, after reading the above explanations, together with the enclosed reports, still claim that they have been misled by the prospectus, shall withdraw if they wish to do so. In this event shareholders should fill in and sign the enclosed form, and send it, together with their allotment letter, to the Company's offices, addressed to the secretary, within the next seven days.
>
> In conclusion the directors regret that there has been some delay in the issue of this circular, but as there have been many technical and legal questions involved which have necessitated taking counsel's opinion, such delay was unavoidable.

The following letter has also been issued to the shareholders of the London Electrobus Company, Ltd.:—

> DEAR SIR, or MADAM,—With reference to the circular recently issued by the directors of this Company, we are instructed by our client, Captain James Spencer Orr, to inform you that he resigned his position on the Board prior to the issue of their said circular, the report of the electrical expert, employed by him, on the value of the "Electrobus" from a commercial point of view being unfavourable. He is, therefore, in no way responsible for the circular.
>
> We are, &c.,
> ASHURST, MORRIS, CRISP, AND CO.
>
> 18th May.

In our issue of May 5th (p. 557), we published a letter from Mr. Oppermann which was sent by him to the London daily Press, as well as to ourselves, and in the same issue (p. 547) we printed the reply that we had forwarded to the various papers in which his letter had appeared. Now, after a delay of nearly three weeks, Mr. Oppermann has thought fit to answer our challenge, in the following manner. As our reply is also published below, we do not think Mr. Oppermann's letter calls for any further comment from us :—

ELECTRICITY OR PETROL?

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I enclose copy of a letter I have sent to the Press in reply to your remarks which appeared in the issue of 5th inst.

I remain,
Yours truly,
CARL OPPERMANN.

May 16th.

[Enclosure.]

SIR,—In the reply to my letter of the 26th ult., the Editor of THE AUTOMOTOR JOURNAL has challenged me to substantiate my statements as to the rate at which the battery for an electric brougham can be maintained.

The Editor, drawing attention to the failure of the London Electric Cab Company started nearly ten years ago, refers to it as "classical." I need only point out that one of the principal items, upon the cost of which the success of an electric carriage company must depend, viz., the electric current, has been reduced to one-eighth of what it was in that case, whilst the life of the present-day battery is so far in advance of what it was, and (in spite of the rise in the price of the raw material) its cost so much less, that to ignore these facts hardly denotes an open mind on the subject. Still less so in view of the fact that such a firm as the Tudor Company has guaranteed the upkeep of the batteries to be used on the new petrol electric 'bus at £10 per annum for ten years, a sum hardly one-fifth of what I consider sufficient in the case under consideration.

So much depends on the management and the whole system on which such a company is run, and after having made this matter a study for so many years, I have certainly not the slightest intention of making public all the details, and by so doing, practically throwing to the winds the enormous amount of labour entailed.

I remain, Sir,
Yours truly,
May 16th. CARL OPPERMANN.

The following is our reply to Mr. Oppermann's letter, sent to the Press :—

SIR,—Mr. Carl Oppermann's letter hardly appears to call for any reply from us. In our letter of the 20th ultimo we expressed our willingness to investigate the books and the internal workings of any electric vehicle undertaking that would show the results claimed by him. In fact, we challenged him to substantiate the very misleading statements made by him in his letter of the 26th ultimo. After a delay of a fortnight, he declines to accept our offer on the grounds that he does not wish to make public the results of his past work! Although scarcely relevant to the main subject, Mr. Oppermann has introduced another point that concerns a totally different type of vehicle—the petrol-electric 'bus. From his remarks concerning them, we can only conclude that his preoccupation with purely electric vehicles has prevented him from keeping in touch with automobile developments that have taken place in other directions. Thus, for instance, he is apparently oblivious of the fact that the prime cost of the battery on a petrol electric 'bus (of the type to which he refers) is only about £30, whereas the prime cost of the batteries needed for each Electrobus would be £350 at the very least. It would doubtless also interest the financial public to know that a much more durable type of accumulator can be used on a petrol-electric vehicle than on a purely electric vehicle, the reason being that the relatively greater weight of the "stationary" type (as against the "traction" type) is no longer prohibitive.

I am, &c.,
THE EDITOR OF THE AUTOMOTOR JOURNAL,
44, St. Martin's Lane, W.C.,
May 18th.

Several motions were last week before the Courts in respect to moneys subscribed for shares in the London Electrobus Company, Ltd.

Mr. Justice Buckley made two orders, in one case to rectify the register of the Company by removing the names of certain applicant shareholders, on account of misstatements in the prospectus, and in the other case to restrain the Company from dealing with the moneys paid. In neither case was any opposition made on behalf of the Company.

Mr. Justice Swinfen Eady and Mr. Justice Joyce both made similar orders in regard to the rectification of the register—the latter order was in respect to 250 applicants. The Company was ordered to pay the costs.

CORRESPONDENCE.

****The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

GEARLESS CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I note with pleasure that Mr. S. F. Edge has had the courage of his convictions, and allowed one of his 60-h.p. six-cylinder Napier cars to be tested by the A.C.G.B.I. for possibilities of running without the necessity of a gear-box. In the report in this week's issue of the *A.C.G.B.I. Journal*, I notice that the engine was stopped no less than seven times, and also that five of these times were in traffic. I think it would be to advantage if it were stated whether it was possible to start the engine from the driver's seat, or whether it was necessary for the engine to be turned by hand to get it to start, as, if the latter was the case, I think it would be a very serious objection.

Yours truly,
York, May 17th. "INTERESTED."

CUBIC CAPACITY AND EFFICIENCY.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In attempting to prove that a standard 6-cylinder Napier could not develop 40 h.p. with its cylinder capacity of 300 cub. ins., Mr. Weigel—who, I understand, belongs to a firm of dealers in foreign motor cars—wrote to you recently in reply to a previous letter from me on the subject, as follows :—

"I will undertake to purchase from him (Mr. Johnson) a 6-cylinder Napier (4 ins. by 4 ins.), for the full catalogue price, plus £100 commission for himself, subject to a Faraday House test that it will take a load of 40 h.p. for two hours."

As I had often seen the standard 6-cylinder 40 h.p. Napier engines being tested at the Napier works, and knew that they had to show a horse-power far above 40 during the severe and lengthy tests to which they are all put, I asked Mr. Napier to allow the Faraday House officials to test an ordinary standard 40-h.p. 6-cylinder Napier for two hours, as Mr. Weigel suggested, and I obtained an official Faraday House certificate to the effect that "The test was started, and continued for two hours four minutes. The average load throughout this period was 43 b.h.p., the maximum load being 45-8 b.h.p. and the minimum 42 b.h.p."

I shall now be pleased to receive Mr. Weigel's cheque for £1,050 in payment of the 6-cylinder Napier chassis, which he undertook to purchase. As regards the £100 commission, as I do not wish to profit by Mr. Weigel's misplaced self-assurance and his unwise challenge on a subject of which he evidently knew so little, I shall be satisfied if, instead of paying me £100, he forwards cheques for £50 to the Motor Union and £50 to the British Empire Motor Trades' Alliance, asking them to acquaint me with the receipt of same.

I trust that this practical proof will impress on Mr. Weigel the absurdity of his method of arriving at the horse-power of an engine by calculating the cubical contents of its cylinders, and I have no doubt that like others who have not studied the advantages and efficiency to be obtained by the use of an accurately designed 6-cylinder motor, he will be surprised when he has a practical experience with the chassis which he has undertaken to purchase, and will probably attempt to copy it in the same way that over forty other manufacturers are now doing.

Yours truly,
May 18th. B. JOHNSON.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have learnt with considerable surprise that Mr. Johnson, of the firm of Messrs. S. F. Edge, Ltd., has sent round a circular letter suggesting that a Faraday House test has been taken of a so-called 40-h.p. Napier.

Mr. Johnson's or Mr. Edge's action is somewhat inexplicable. I issued a challenge in the Press to both these gentlemen (and to the former verbally), which was refused. But now in secrecy, without inviting me—in fact, without informing me even up to the present moment—that any test had been made or arranged, a circular is issued suggesting that the engine in question has been tested and found to give excellent results. Until I am invited to that test and see it for myself, or until I know that the engines have been measured by independent persons, it is with great regret that I must doubt the genuineness of the test at all.

Faithfully yours,
May 21st. D. M. WEIGEL.

P.S.—A representative, on my behalf, called at Faraday House, who expressed a regret to him that, by desire of their client, they were unable to reveal the details of the test.

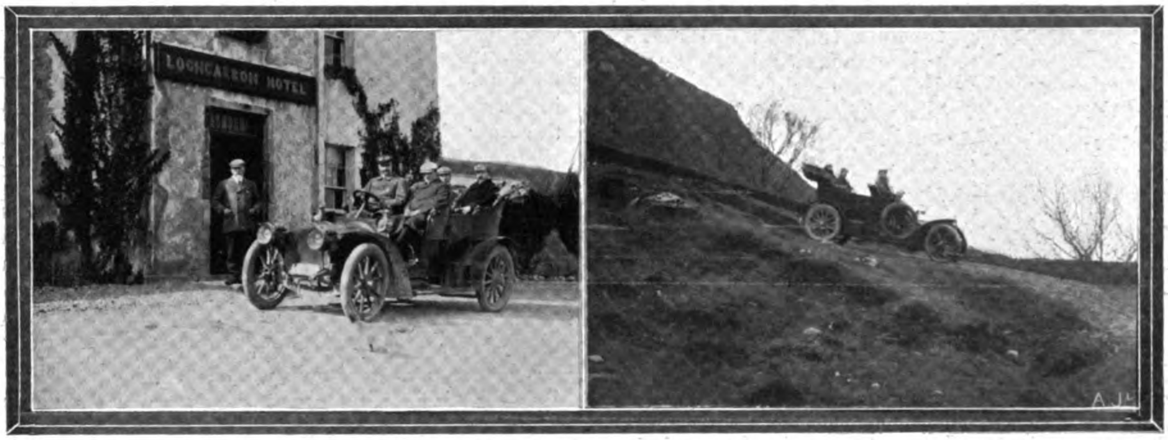
Motoring on Mountains.

NOT content with his little trip over the Alps last year, Capt. Deasy has been searching for fresh hills to conquer, and has apparently found satisfaction in the discovery of some Scottish heights, which he forthwith proceeded to surmount with his famous 24-h.p. Martini.

Between the head of Loch Striven and Otter Ferry is the steepest of the hills which Capt. Deasy selected for his trials. It is stated to have a gradient of 1 in 3¾ at its worst part; but the car was, nevertheless, successfully driven to the top with its full complement of five passengers. Prior to this test, however, a run was made up Balloch Hill from Tournapress. This road is depicted in Route 330 of the Contour Book, and the hill itself is some six miles long, and has a maximum gradient of 1 in 5·7. Not the least important feature of the tests relates to the holding power of the brakes. Capt. Deasy is a strong advocate of the practice of making use of the engine when descending long hills, and states that he did so on these occasions. Although the foot brakes on Martini cars are water cooled, the feed pipe was disconnected during the trials on purpose to see if the brakes would heat, but of this, we understand, there were never any signs.

A Threatened Motor 'Bus Strike.

APROPOS of strikes, it is rather disheartening to learn that in the newest of all industries all the familiar troubles seem to be brewing. The slumbering discontent amongst the drivers and conductors of Vanguard motor 'buses, threatens to assume the form of a regular strike, just as if the case was one of some industry decades or centuries old. The principal points in dispute are the pay and the number of hours worked per day. Certainly as far as can be judged at present the men's demands seem reasonable enough, and when it is borne in mind that the earning capacity of a motor 'bus is put down at from £7 to £10 per day, wages of 7*s.* per day for the driver and 6*s.* for the conductor do not seem out of the way. A more important point perhaps is the number of hours they are kept at work. The drivers contend that nine hours is as much as their nerves will stand, and it appears that in many cases they are worked for much longer than that. This would certainly appear to be a matter which not only concerns the drivers themselves but is of even greater importance to the travelling public. The case is not on all fours with that of the horse omnibus. When the nerves of a motor car driver are overtaxed the lives of thirty-three passengers are at stake. Even with railway signalmen, whose occupation is restful compared with the lot of a motor 'bus driver, the railway companies have found that general safety has been greatly increased by 8-hour shifts. Nine hours at a stretch (with an interval for meals) at the steering wheel of a motor 'bus is, one would imagine, as much as flesh and blood could regularly stand.



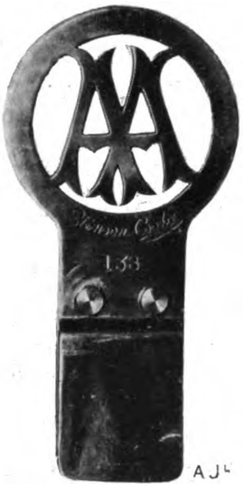
Captain Deasy on his Martini Car at Lochcarron Hotel, and whilst descending from one of the high altitudes to which he recently climbed in Scotland. In the right-hand picture Captain Deasy's car is shown brought to a standstill, on an extremely stiff gradient, to demonstrate the perfect control over the car by the brakes.

The Small Boy Nuisance.

SMALL boys who surreptitiously arm themselves with catapults, and have selected automobiles as a large and comfortable target for their missiles, should remember that in future they are likely to be prosecuted, and that the whole force of the Motor Union will be behind the prosecution. An Essex member of the Union was recently motoring on the Colchester Road, when near Wickham a stone impinged upon one of the panels of his car with such violence as to considerably dent it in. Investigation traced the missile to the catapult of a neighbouring small boy, and particulars having been obtained, the Union was communicated with, and counsel has been retained to prosecute the urchin. It is always well to stop this sort of thing, as an Irishman would say, "before it begins." The celebrated prosecution of the Ripley butcher seems to have been instrumental in stopping assaults on motorists with cudgels, but motoring would soon cease to be an enjoyable pastime if every naughty little boy who can put a catapult together might discharge stones at passing cars without any ulterior consequences to himself.

Exhaust Smoke Indicator for 'Buses.

SOME wag once suggested that motor 'buses would soon cease to smoke if, instead of discharging fumes, when they produced any, behind, the exhaust pipe came up in front of the driver. This proposal has been positively put forward in a modified form in connection with motor 'buses, and it is suggested that a small pipe from the exhaust should be brought up near the dashboard so as to show the driver when he is over-lubricating. It is rather doubtful, however, whether the trouble will be alleviated in this manner. The driver knows, as a rule, well enough when he is over lubricating, but he does it all the same. Perhaps if the whole of the discharge took place near his olfactory organs, the cure would be a more radical one.



Distinguishing brass car badge issued to Members of the Automobile Association to enable the A.A. Scouts to immediately recognise their supporters. This is designed to be fixed to the middle of the top of the dashboard or canopy.

Automobile Demonstration at Madrid.

AUTOMOBILISTS will be universally pleased to note that the motor car will occupy an honoured place in what will doubtless be one day regarded as the historical pageantry with which the nuptials of King Alfonso and Princess Ena are about to be celebrated in Madrid. A most effective episode in the multitudinous festivities is being organised by the Royal Automobile Club of Spain. All the Spanish aristocracy who own automobiles have declared their intention of taking part in the procession of cars which is to pass before, and be inspected by, Princess Ena. Already, at least, 250 cars are to come from all parts of Spain, and the procession will be formed in Madrid, and proceed from the Capital to El Pardo. King Alfonso himself, it is stated, will head the procession, accompanied by the Infante and other princes, and after the passage of the cortège a lunch will be given at the Royal Automobile Club.

Another "Bob Walker."

MADAME BOB WALKER has again been successful in arranging her favourite form of advertisement for the beginning of the Paris season—a young lady has been abducted in one of the Bob Walker Cars—as usual.

Ducellier Headlights.

THREE new Ducellier headlights have been introduced by Messrs. André A. Godin into their very extensive list of these famous lamps. The three new projectors in question differ only in their illuminating power, for they are all constructed on the same principle, the new feature being a special tap for automatically cutting off the water supply at the same time as that of the gas. This, it is claimed, enables the generator to be charged at any time previous to when it is required, and Messrs. Godin guarantee that headlights of this pattern will be found to work perfectly well, even a month after the charging operation. Like all other Ducellier projectors, the generator is designed to operate with ordinary commercial carbide, and their size is such that they will give a continuous light of over six hours' duration, and will project a beam from 250 to 350 yards in length.

Among the other novelties introduced for the ensuing season is a helmet-shaped projector, which is designed to prevent the light from rising above the level of the lamp, and thus interfering with other users of the road. Motorists will also appreciate a new adjustable lamp bracket, which has been introduced. It is mounted on a swivel, so that the light can be projected in any direction, and the arms which actually carry the lamp are made extensible, so that they can be adjusted to suit a projector of any size.

Progressive Lowestoft.

WE are pleased to see that the outcry in favour of increased taxation for automobiles on account of the dust that they are said to raise, and the suggestion that this taxation should be employed for anti-dust purposes has evoked considerable protest from the town of Lowestoft, the prosperity of which is to a large extent bound up with the automobile movement, owing in no small degree to the energy and growing importance of the well-known Brooke company. The Town Council has passed a resolution condemning the proposal and at any rate one local paper—the *Lowestoft Journal*—fully endorses their action. Our Lowestoft contemporary very pertinently points out that of the taxation raised in the manner proposed, probably not one halfpenny would ever be employed in road construction or improvement.

The Paris Strike.

THE political character of the widespread strikes which have recently convulsed portions of France and extended to Paris itself, where as many as 110,000 workmen were at one time "out," is pretty clearly shown by the manner in which it extended to the automobile industry, in which compared with other trades the conditions for the workers are tolerably satisfactory. The strike is however rapidly weakening, and now practically the whole of the automobilist strikers have gone back to work. What it was all about nobody on this side of the Channel seems to have any idea, and probably not many in France itself. The only salient point which emerges, the only demand of which any sense can be made, is that the English week, that is the free Saturday afternoon, should be adopted by French manufacturers. That certainly would seem to have a good deal in its favour, but almost for the first time in the history of French industries, the manufacturers are combining on an extensive scale, and it rather looks as if our neighbours across the Channel are likely to be involved in a very serious and widespread labour conflict, a form of trouble from which, as compared with some other industrial nations, France has in the past been comparatively free.

Mr. Charles J. Glidden continues his remarkable travels round the world on his Napier Car. From Hongkong, where he has just completed upwards of 32,000 miles in 32 different countries, he sends us a photograph of the entrance to the Opera House at Saigon, which was visited by him during his tour.

The Dust Nuisance and the Local Government Board.

SOME little time ago the Roads Improvement Association approached the Local Government Board with a view to obtaining the co-operation of that body in rendering assistance to local authorities in regard to attempts to solve the dust problem. The suggestions made by the Association to the Local Government Board were as follows :—

1. That the Local Government Board prepare a return of the steps that have so far been taken by Highway Authorities to construct roads of dustless materials.
2. That the Engineering Inspectors of the Board investigate these experiments, and issue a report for the guidance of Local Authorities, dealing with the results so far secured, and giving such guidance as may be possible as to methods of construction, degree of dustlessness secured, durability of materials, and comparative cost.
3. That the Local Authorities be encouraged to contribute towards the cost of certain experiments with dustless materials about to be made by the Association, and that the Local Government Board appoint a representative to act upon the Committee which has charge of these experiments.
4. That the Local Government Board represent to the Chancellor of the Exchequer and the Government the desirability of giving effect to the recommendation of the Royal Commission on Local Taxation (Lord Balfour's Commission)—a recommendation subsequently endorsed by the Departmental Committee on Highways appointed by the Board—that a further contribution of one million sterling should be made annually towards the cost of the maintenance of main roads, and that that grant should be accompanied by conditions calculated to secure efficient maintenance.
5. That the Board promote legislation empowering County Authorities to fix a minimum width for all trunk roads.

To these proposals the following reply from the L.G.B. has now been received :—

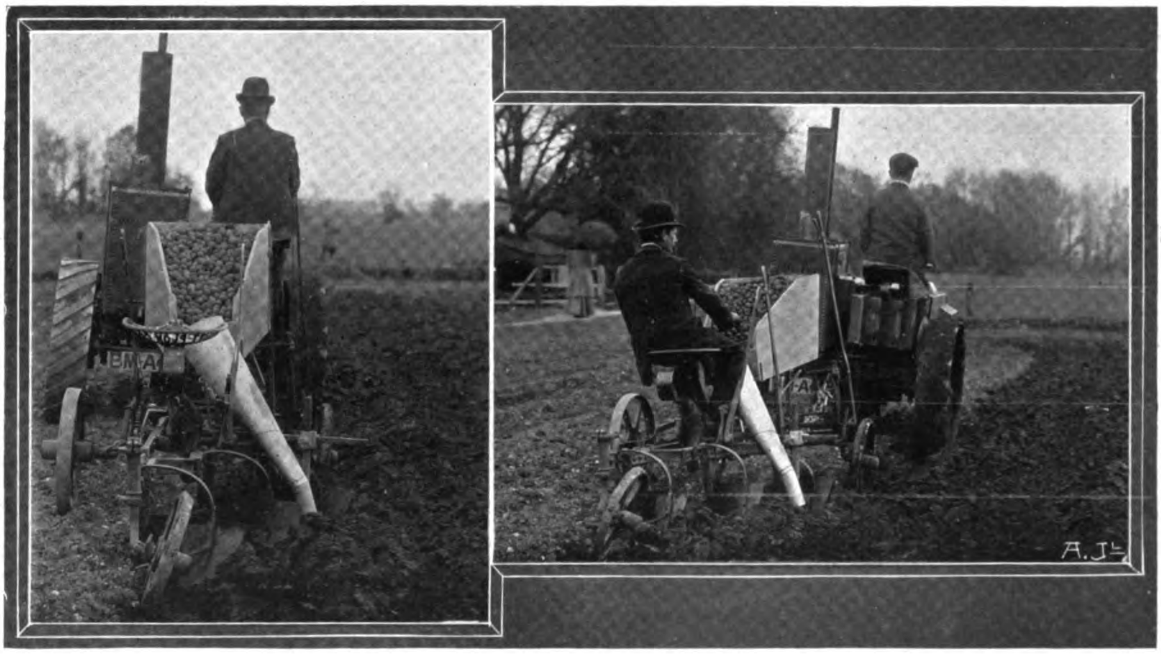
1. It does not seem to the President that the time has yet arrived when such a return as is suggested could usefully be obtained.
2. With regard to this suggestion, it would seem that the information referred to could be obtained only by constant observation, and would not be secured by the occasional visits of an engineering inspector. The matter will, however, be considered, and if it is found that the Board obtain any information which can usefully be imparted to Highway Authorities, that information shall be communicated to them.
3. Local Authorities would have no authority to contribute towards experiments on roads in an area outside their jurisdiction, and, therefore, no encouragement could be given to their doing so.

As regards 4 and 5, both of which would involve legislation, without going into the merits of either recommendation, the Government cannot contemplate legislation on these subjects in the present Session.

It will be observed that this reply amounts, to all practical intents and purposes, to a refusal to consider the proposals made by the R.I.A. The situation is thus hardly satisfactory, and we have accordingly commented upon it in our Editorial columns.

For the Sinews of War.

THE Motor Union is making a general appeal to the automobile trade in this country to contribute to their funds. It is only a short time ago that we described at length the recent important services of the Motor Union to the cause, and pointed out that the truest policy for all interested in the movement is to subscribe as liberally as they can to the Union's war chest. The assistance that the Union provides in cases of legal proceedings and police persecution, forms one of its departments of activity which have been most beneficial to progress, and it is this department which makes the most extensive inroads on the finances. In a circular which the Union is now sending round, we are pleased to see that they pay us the compliment of quoting the arguments which we have previously put forward in regard to the aspects of the situation.



There will soon be little in agricultural work for the Ivel motor to conquer. From time to time we have given illustrations of this machine performing various agricultural operations. The above photographs show an Ivel motor hauling a three-furrow plough to which is fitted the Ivel Potato Setter. This device is for setting potatoes whilst the ploughing is going on. The potato hopper is attached to the framework of any ordinary two or three-furrow plough. The man on the plough feeds the tube through which the potatoes pass from the hopper. The tube of the hopper sets the potatoes just behind the first breast-plate of the three-furrow plough as shown in the photograph. Running downwards from the frame of the plough is an adjustable skimmer, which makes a ridge behind the first breast-plate, and the potato drops in the hollow formed by the breast-plate, thus preventing the potato dropping right down to the bottom of the ordinary ploughed furrow. This mode of potato planting is done in one operation, costing no more than when ploughing alone, and the seeds are set with regularity. Mr. W. McArthur, of Quy, Cambs., who has been using one of these machines, states that he put in 16 acres at the rate of 3½ acres per day.

"Tramway Mad."

SPEAKING on Monday at the Royal Institute of British Architects, on the Traffic Commission's recent report, Mr. Paul Waterhouse said that "Without wishing to be disrespectful, the Commissioners were tramway mad. They seemed to have entirely missed the motor omnibus."

Vanguards for the Derby.

THOSE who like to go to Epsom by road for the Derby will this year have an opportunity of making the journey by motor 'bus, the Vanguard Company having decided to run eleven of their vehicles to Epsom and back on Derby day.

The Old Discredited Policy Once Again.

THE municipalities interested in electric tram undertakings are beginning more and more to dread the motor 'bus. At least this is very clearly evidenced by the circumstance that the suggestion is being put forward that the motor 'bus does not contribute adequately to the rates. Tramway undertakings, it is said, contribute sometimes as much as £500 per mile per annum to local rates. It is not quite clear whether this is due to the manner in which the trams are rated, or to the extent of which their earnings contribute to relieve the rates, but this figure is being put forward as the basis on which the motor 'bus should be taxed. We submit that this is really the old policy (of 80 years ago) of injuring the automobile movement by means of the prohibitive tolls in a modern form. A lot of 'bus companies necessarily have garages, and it is these that should be rated as in the case of any other business, and this of course is, as a matter of fact, done. But to impose a tax upon them in addition on the basis of the mileage they run would be a monstrous injustice.

Further Unjustifiable Opposition.

A PRECISELY similar spirit is being displayed by the representatives of the Municipal Tramways of Great Britain, who have determined to demand the deletion from all railway companies' bills of any clauses giving them power to run motor 'buses in which the local authority owns or works tramways. The same body resolved that "all practicable steps should be taken with a view to bringing about this result." It is well perhaps that they draw the line at *practicable* steps.

Sir John Macdonald, K.C.B.

BY reason of the help which Sir John Macdonald has given to the automobile movement, and the influence he has exerted for its betterment, Professor Hubert Von Herkomer has very generously undertaken to paint a portrait of Sir John, to be hung in the A.C.G.B.I. Club House. Needless to say, Professor Herkomer's very splendid offer has been cordially accepted by the Automobile Club Committee.

Brighton Motor Road.

WE recently recorded the decision of the Divisional Court in regard to surcharging the members of the Brighton Corporation with the cost of laying Tarmac on the Madeira Road specially for the purpose of running the motor races last year. The Corporation, acting on counsel's opinion, has, we now understand, decided to appeal against this decision. Local feeling is distinctly against the members of the Corporation being penalised in this manner, as whatever may have been done by them, serious objections were not raised at the time by those who have subsequently taken action. There can be no possibility of a suggestion of corrupt motive on the part of the members of the Corporation, and it is felt that they acted in the belief that they were consulting the best interests of the town in enabling the successful meeting to take place.

The "Little Guide Series."

A GOOD time ago we devoted a rather enthusiastic review to the "Little Guide" which described the North Riding of Yorkshire. It was so admirably written and so enthusiastic in its descriptions. The present volume on the East Riding of Yorkshire (Little Guide Series, by Methuen) is by the same author, preserves the same high level as its predecessors, and forms an excellent guide book, particularly for those who are fond of ecclesiastical architecture. Of the companion volume recently received—"The Little Guide for Northamptonshire"—almost the same remarks may be made. Northamptonshire has not hitherto been a particularly favourite county with tourists, so that this book does admirable service in bringing visibly before the reader, by a number of excellent photographs and illustrations, the great wealth in ancient monuments, old houses, and historical associations which the county possesses. A scientific feature of this "little guide" is the chapter on geology.

In the early days of motoring, one of the greatest offences attributed to the automobile, by admirers of the ultra artistic, was its clumsy and unbalanced appearance. In up-to-date motor cars, the most fastidious cannot now claim to dislike the motor car on this account. The lines in the design of high-class automobiles are, even to the most critical, delightfully conceived, and in the majority of cars the balance to the eye may be termed perfect. In the above photographs we reproduce a 40-h.p. 6-cylinder Napier as a very good example of this contention, the car being seen both open and shut.

An Absent Minded Beggar.

Mr. C. R. Garrard, of Clement-Talbot, Limited, seems to be frequently having quaint experiences. We retailed one of these last week. Now he has had another adventure worth recording—this time due entirely to himself. He was absent-mindedly driving his car almost up to the legal limit of speed when the sudden apparition of a timber waggon necessitated a violent sudden stop, with resulting damage to one of his tyres. Mr. Garrard was naturally irritated, and as he set to work to repair the injured tyre, treated the waggoner, who was looking on with a good deal of *schadenfreude*, to some of the gems from his extensive vocabulary. The tyre finally repaired, Mr. Garrard started the engine and mounted the car, put the speed lever into the first notch, engaged the clutch, and naturally expected to glide easily and gracefully from the scene. Nothing of the sort. The car refused to budge, and almost immediately Mr. Garrard recognised that he had forgotten to remove the jack. It was then the waggoner's turn to make remarks—and he made them.

* * * *

COMMERCIAL POINTS.

Mr. Geo. W. Williams.

A very pleasing incident took place on Tuesday evening last, at the Collier Company's place in Long Acre. Just at the time of closing, the staff presented Mr. Geo. W. Williams, their general manager, with a very handsome tantalus, as an expression of their appreciation. As we have already noted, Mr. Williams has taken up the position of general manager to the Deasy Motor Car Manufacturing Company, Ltd.

Herkomer Trophy, 1906.

A British team of twelve Daimler cars is, we learn, going over to Frankfort for participation in the Herkomer Trophy contest next month, and out of these twelve cars nine will be fitted with "Continental" tyres, in the majority of cases of the latest non-skid type. Mr. Robertson Grant, of Edinburgh, is also entering an Argyll car, which will likewise be fitted with these well-known tyres.

Messrs. S. F. Edge are noted, among other things, for the excellent taste which characterises the compilations which they issue as catalogues. Their latest production in this direction consists of a neat little book on Napier Motor Boats. It contains some useful and instructive information about the Napier marine motors and propelling mechanism, and short articles are given about the more famous Napier racing boats, including one on the well-known cruiser, "Napier Major," now on its long sea journey. Throughout, the work is well illustrated by admirably executed reproductions from photographs.

His Majesty King Edward VII has, we are informed, taken delivery of a 45-h.p. 1906 Model Mercedes, this being the fourth Mercedes car he has purchased.

The great importance of using the most suitable oil for lubricating different makes of cars has led the manufacturers of the Argyll car to experiment considerably with the object of determining on the most suitable oil for their models. Argylls London, Limited, now announce that they are having a special oil prepared for them by the Vacuum Oil Company, as the result of these experiments, for use in connection with the engines on their cars, the oil being put up in special tins.

Amongst recent orders placed for Argyll cars is one from the Rajah Muda of Sarawak, who has selected a 10-12-h.p. 2-cylinder car, which the Rajah is already driving himself. The Crown-Agent for the Colonies has, we learn, also placed an order for one of the 10-12-h.p. 2-cylinder Argyll cars, for the use of one of their officials in the East.

Leading American automobilists are taking very kindly to British cars. Mr. Vanderbilt has just purchased a Daimler car, and Mr. Yokun, the present president of several of the American railway systems, is also one of the latest recruits to the Daimler patrons.

PUBLICATIONS RECEIVED.

The Black Motor Car. By Harris Burland. London: E. Grant Richards. Price, 6*s.*

The Channel Tunnel: Its Commercial Advantages.

The Art of Driving a Motor Car: By Lord Montagu (Editor of *The Car*). London: The Car Illustrated, Ltd. Price, 1*s.* net.

Motor Car Mechanics for Beginners. By G. Foster Pedley. London: The Car Illustrated, Ltd. Price, 1*s.* net.

Oban, and the Land of the Gael. By George Eyre Todd. Glasgow: The London Caledonian Railway Co. Price, 2*d.*

Through Scotland by the Caledonian Railway. Glasgow: The Caledonian Railway Co. Price 2*d.*

Official Guide to Hotels and Furnished Lodgings. Glasgow: Caledonian Railway Co.

The Cyclist's Companion Road Guide. Bristol and District. Bristol: W. C. Hemmons, St. Stephen Street.

The Little Guides. Oxfordshire. London: Methuen and Co. Price 2*s.* 6*d.* net.

Catalogues.

"*Amac*" *Motor Car Accessories.* The Aston Motor Accessories Co., Ltd., Birmingham.

"*Ducellier*" *Motor Lamps*, 1906. Andre A. Godin, 1, Red Lion Square, Holborn, W.C.

Napier Marine Motors. S. F. Edge, Ltd., 14, New Burlington Street, W.

* * * *

LAW REPORTS.

Chains "Made in France."

Messrs. Peugeot Frères were fined £20, with £15 costs, at Birmingham, on Monday last, for selling foreign cycle chains as the *bona fide* productions of the United Kingdom, and having a false description attached to those in their possession. Ten thousand chains which had been confiscated were returned to the defendants on condition that the boxes and labels were destroyed, and one link in every chain stamped "Made in France."

* * * *

BANKRUPTCY COURT.

Motor Car Company, Limited.

Under the winding up order made against the Motor Car Company, Limited, on March 13th last, meetings of the creditors and shareholders were held last week at the offices of the Board of Trade. Mr. H. Brougham, senior Official Receiver, reported that the company was incorporated in February, 1905, for the purpose of selling motors upon a scheme by which advertisements were inserted in several periodicals inviting intending purchasers of cars to fill up a form and forward it to the Company, which would thereupon, at its own expense, submit the requirements to three gentlemen known in the motoring world for their opinion as to which make of car would best meet the stated requirements of the applicant. The Company obtained orders for a number of the cars, its profit being the difference between the price paid by them to the makers and that paid by the purchaser. The formulator of the scheme was Mr. R. Moffat Ford. He and Mr. M. W. Watts were the only directors. There was no necessity for any qualification, and the directors' remuneration was to be fixed by a general meeting. The amount drawn had been £502 by Mr. Ford and £417 by Mr. Watts. Mr. Ford denied the accuracy of his amount. A previous company with a similar title had been registered by Mr. Ford in 1899, and this went into voluntary liquidation in 1901. The new Company also acquired a patent for a motor car alarm, and other accessories, for £1,992, payable in fully paid shares. Messrs. Ford and Watts were to provide such loans as might be necessary for the carrying on of the business, secured upon mortgage debentures, and were to receive £300 a year for three years. The Company did not keep a stock of motor cars, but acted as intermediaries, and the stock of accessories had been sold under a distress for rent, but did not realise sufficient to pay the same. The amount due to the creditors for moneys received by the Company on behalf of customers and goods supplied was £4,353, and the only assets were the alarm patent and an interest in another patent in connection with tyre inflation, neither of which had any present realisable value. Mr. Ford said there was every prospect of an arrangement being come to by which a sum would be provided to pay the creditors 5*s.* in the pound, the balance of the debts being satisfied by shares in a new company to be formed. The liquidation was left in the hands of the Official Receiver, with a committee of inspection of three creditors.

COMPANY DOINGS.

Motor Traction Company (1905), Limited.

AN extraordinary general meeting of this Company will be held on May 29th, for the purpose of considering, and, if thought fit, passing a resolution authorising the directors to sell the undertaking of the Company to a new company in course of formation with a share capital of £400,000. An offer has been received by the directors to purchase the Company's undertaking at the price of £150,000, which is equal to a premium of 5*s*. per share upon the total share capital of the Company. Of the £400,000 capital, shares representing £200,000 will be expressly set aside to provide working capital. The directors consider that adequate working capital is essential for the proper working of the Company's valuable patent rights, and this fact has influenced them in favourably receiving the proposal in question, and in determining them to ask the shareholders to give them the necessary authority to carry into effect the offer which has been made.

NEW COMPANIES REGISTERED.

Aldershot and Farnborough Motor Omnibus Co. (Ltd.).—Capital £3,000 in £5 shares. First directors, J. May, Dr. D. Donald, T. M. Foster, R. H. Lloyd, and R. J. Stirling.

Beaufort Motor Co. (Ltd.), 14, Baker Street, W.—Capital, £150,000 in £1 shares (75,000 preferred ordinary). First directors, J. E. Lound, R. V. Jellicoe, A. V. Cowell, Sir F. Frankland, and W. A. Turquand.

Burnley Motor Pleasure Co. (Ltd.), 23, St. James Row, Burnley.—Capital £2,000 in £1 shares. Objects, to carry on at Burnley or elsewhere the business of omnibus, motor car, and motor boat proprietors, &c. First directors, R. Haythornthwaite (chairman), E. B. Billington, J. Hodgson, J. Knape, jun., A. Cooper, and E. Whitehead.

Darracq-Serpollet Omnibus Co. (Ltd.), 2, Coleman Street, E.C.—Capital, £500,000 in £1 shares (200,000 preferred ordinary).

General Motor Cab Co. (Ltd.).—Capital £260,000 (257,000 preferred ordinary of £1 and 60,000 deferred of 1*s*.). Objects, to adopt an agreement with the United Investment Corporation, Limited, and to carry on the business of motor cab proprietors, &c.

Handsworth Cycle and Motor Manufacturing Co. (Ltd.).—Capital £2,000 in £1 shares. Objects, to take over the business of a cycle manufacturer carried on by G. E. Willmott at Princip Street, Birmingham, and at Alcester, as the Handsworth Cycle and Motor Manufacturing Company and the Rotary Cycle Company. Permanent managing directors, G. E. Willmott and D. W. Sillars.

Hedgeland and Co. (Ltd.), 76, Cheapside. E.C.—Capital, £15,000 in £1 shares. Object, to acquire from T. K. Webster and F. W. Hedgeland certain inventions relating to axles and clutches, &c. First directors, F. E. D. Acland, G. C. A. Jonson, H. Norman, H. H. Raphael, and T. H. Weguelin.

Industrial Motors (Ltd.).—Capital £2,000 (1,995 £1 ordinary and 100 1*s*. deferred).

Mercedes Daimler and De Dion Motor Co. of Great Britain (Ltd.), 1, Broad Street Place, E.C.—Capital £1,000 in £1 shares. Objects, to carry on the business of motor car, omnibus, &c., proprietors, &c.

Osborn and Co. (Ltd.), 6, Great Marlborough Street, W.—Capital £1,000 in £1 shares. Objects, to manufacture, sell, &c., motors, cycles, &c. First directors, W. E. Owen and F. J. Osborn.

Scottish Electrobus Co. (Ltd.). — Capital, £100 in £1 shares. Objects, to adopt an agreement with the X Electric Accumulator Co., Ltd., &c.

Sphinx Engine Co. (Ltd.), 6B, Virginia Street, Southport. Capital, £1,400 in £1 shares. Object, to take over the business of engineers and automobile manufacturers carried on by W. S. Paris and M. E. M. Vint, at Southport. First directors, W. S. Paris and M. E. M. Vint (managing directors), and N. Battersby.

Tacchi's Patents (Ltd.), 78, Hamilton Street, Bishopsgate Street, Without, E.C.—Capital, £100 in 1*s*. shares. Object, to acquire from P. G. Tacchi patents for motors, motor cars, and accessories, &c. First directors, P. G. Tacchi and O. Percy.

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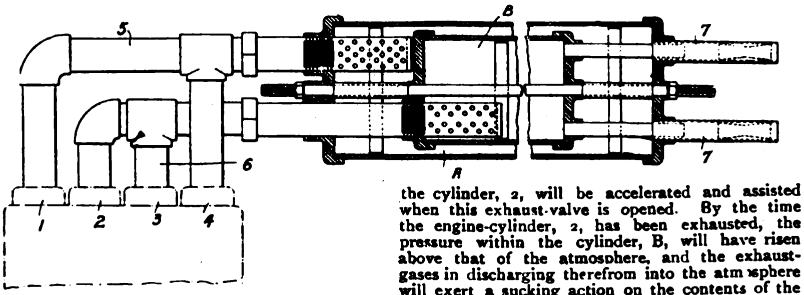
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

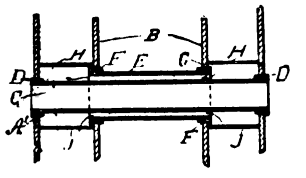
The first date given is the date of application ; the second at the end, the date of the advertisement of the acceptance of the complete specification.

12898. 22nd June, 1905. Improvements in Exhaust Silencers for Internal Combustion Engines. Leonard K. Clark, the St. Louis Car Company, St. Louis, Missouri, U.S.A. The invention relates to improvements in exhaust silencers for internal combustion engines, and is particularly applicable to engines having two or four cylinders. This silencer reduces or minimises back pressure in the engine cylinders and prevents an explosive charge that has missed fire and has been exhausted from one of the engine cylinders from being ignited within the silencer. There are two figures. Fig. 1 is a diagrammatic view of a 4-cylinder engine with the silencer fitted. 1, 2, 3, and 4 are the four cylinders of the engine. These engine cylinders exhaust into two exhaust-pipes, 5, 6, the cylinders, 1, 4, being connected with the exhaust-pipe, 5, and the cylinders, 2, 3, with the exhaust-pipe, 6. The pipes, 5, 6, lead to the silencer, which has two chambers and comprises two concentric cylinders, A, B. The pipe, 5 leads to the cylinder, A, and the pipe, 6, to the cylinder, B. The cylinder. B, is the inner of the two cylinders, A, B. The ends of the cylinders, A, B, are closed by walls through which at one end the exhaust-pipes, 5, 6, extend and enter their respective cylinders. As the cylinders of a 4-cylinder internal combustion engine are fired in the order 1, 2, 4, 3, the exhaust-pipes, 5, 6, are connected to the cylinders, A B, in order that the exhaust-gases may be discharged into the cylinders, A, B, alternately. When the engine-cylinder, 1, exhausts into the cylinder, A, the pressure within this latter cylinder rises above atmospheric pressure ; this pressure is relieved by the exhaust-gases passing through the tubes, 7. The flow of the exhaust-gases from the tubes, 7, will exert a sucking action on the contents of the cylinder, B, thus reducing the pressure therein to below that of the atmosphere and creating a partial vacuum. By reason of this partial vacuum within the cylinder, B, the flow of the exhaust-gases from the cylinder, 2, will be accelerated and assisted when this exhaust-valve is opened. By the time the engine-cylinder, 2, has been exhausted, the pressure within the cylinder, B, will have risen above that of the atmosphere, and the exhaust-gases in discharging therefrom into the atmosphere will exert a sucking action on the contents of the cylinder, A, thus reducing the pressure therein to below that of the atmosphere and creating a partial vacuum. The engine-cylinder, 4, will next exhaust and then the engine cylinder, 3, and the exhausting of these cylinders will cause, in the chambers of the silencer into which they exhaust, an action similar to that produced when the cylinders, 1 and 2 exhaust. The flow of the exhaust gases at a pressure above that of the atmosphere from the cylinder, A or B, acts like an ejector upon the contents of the cylinder. B or A, and this ejector-like action is alternate and reciprocal —May 2nd, 1906.

FIG. 1.



26563. 20th December, 1905. Improvements in Radiators for Cooling Liquids, Air, Gases and the like. William C. B. Evans, 401, Deritend, Birmingham ; and William S. Cottrell, Penshurst, Richmond Hill Road, Birmingham. The object of this invention is to provide a radiator of simple construction, of light weight, with large cooling surface in small space, carrying small quantity of water, and circulating same by gravity, thereby obviating the use of circulating pumps, and constructed without the use of solder. There are three figures. Fig. 2 is a section of tubes, showing connection of same to casings. An outer casing, and B, an inner casing, attached together in any suitable manner, form water-tight receptacles. C is a tube extending from side to side of outer casings through apertures, A', in same, these openings being of diameter about $\frac{1}{16}$ in. larger than the tube. D is a hollow wooden cone which is driven in between the tube and aperture in casing, thus forming a water-tight connection. E is a tube of larger diameter than tube, C, and surrounds it, extending from side to side of inner casing and passing through aperture, F, in inner casing, this aperture being also about $\frac{1}{16}$ in. larger than the diameter of the tube, E, this tube being wedged into the inner casing by hollow wooden cone, G, in the same manner as before described with regard to tube, C; a space is thus left between the two tubes. Between each set of tubes are plates, H and J. These plates are alternately perforated, first on one side of the receptacle, formed by the outer and inner casings, and then at the other. Water passes through the space between the two tubes, thence through the perforations to the lower space, thence through the space between the next set of tubes back again, and so on in the same manner alternately from side to side through the apparatus to the outlet, the air for cooling passing through the long tubes.—May 2nd, 1906.



Patent Specifications Published.

Applied for in 1904.

Published May 31st, 1906.

24,009A. — KENDAL. Electrically-controlled valve-gear.

Applied for in 1905

Published May 24th, 1906.

4,085. M. M. SMITH AND A. H. CANSTABLE. Variable speed gear.
9,223. W. BLANC AND L. PAICHE. Suspension.
9,410. J. L. WATKINS AND E. J. CLAYTON. Motor road vehicles.
9,426. G. D. DENNIS. Intl. combn. engines.
9,705. A. COUSEN. Carburetting apparatus.

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DIARY OF FORTHCOMING EVENTS.

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British Events.

June 6	...	Eliminating Trials International Cup (Auto Cycle Club) Knowsley Park.
June 9	...	Hill-Climb (S. Herts A.C.).
June 11–16	...	Land's End to John O'Groat's (Auto Cycle Club).
June 13–16	...	Scottish Reliability Trial.
June 13–16	...	Irish Reliability Trials (Irish A.C.).
June 16	...	Grindleford Hill Climb (Sheffield A.C.).
June 16	...	Ragpath Side Hill Climb (N. Eastern A.A.).
June 16	...	Gymkhana (Essex County A.C.).
June 23	...	South Harting Hill Climb.
June 30	...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
June 30	...	Speed Judging Trials (Essex County A.C.).
July	...	Motor Yacht Club Reliability Trials.
July 2	...	Hill Climb (Wolverhampton A.C.).
July 5	...	Gymkhana at Wadslay Bridge (Sheffield A.C.).
July 14	...	Run for Crippled Children (Sheffield A.C.).
July 14	...	"Henry Edmunds" Hill Climb.
July 21	...	Motor Union Meeting (Bath).
July 21	...	Mablethorpe Sand Races (Lincolnshire A.C.).
Aug. 6–18	...	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8	...	International Cup (Motor Boats) Eliminating Race.
Aug. 9	...	International Cup (Motor Boat) Race at Ryde.
Sept. 22	...	Motor Union Meeting (York).
Sept. 27	...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

June 4	...	Rochet-Schneider Cup (Auvergne Circuit).
June 6–13	...	Herkomer Cup.
June 17	...	Motor Cycle and Light Motor Bicycle Competition (Moto Club de France).
June 26–27	...	Grand Prix (A.C. de F.).
June 28–29	...	Kiel Motor Boat Races.
July 8	...	Motor Bicycle International Cup Race (Austria).
July 14–17	...	Ostende Meeting.
July 15	...	Mont Cenis Climb (Turin A.C.).
July 26–Aug. 15		Circuit Européen.
Aug. 13	...	Ardennes Circuit.
Aug. 18	...	Coupe de Liedekerke (Belgium A.C.).
Aug. 26–Sept. 2		Brescia Week (Italian A.C.).
Sept. 10	...	Florio Cup Race (Italy).
Sept. 15–16	...	Mont Ventoux Hill-Climb.
Sept. 20	...	Lake Major Motor Boat Races.
Oct. 5–14	...	Leipzig Exhibition.
Oct. 6	...	Vanderbilt Cup Race.

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PASSING EVENTS.

An Apotheosis of the Motor Car. The good wishes of practically everybody in Europe are at present with the King of Spain and his Queen in Madrid, and motorists will probably look back upon the royal nuptials with particular favour as, owing mainly to the young monarch's enthusiasm for automobilism, the preliminary festivities, on Monday last, constituted a regular apotheosis of the motor car. Some 300 of them, belonging to the most exalted aristocracy of Spain (almost each of whose names suggest an epitome of the history of their country), assembled in the Paseo de la Castellana, where the cortège was formed up for the procession to the outlying townlet of El Pardo, where the vehicles were to be reviewed by Princess Ena. Never, we believe, has such a collection of cars been marshalled together before, and never have they taken such an imposing part in a public ceremony, decked with flags and covered with flowers as they were, and greeted with the plaudits of the crowd. A notable feature of the situation was the evidence provided of the way in which the automobile tends to make all men equal, even in such a supremely aristocratic country as Spain. For even the King himself and the Royal Princes simply took their positions by lot in the various groups of cars. The whole procession was three-quarters of a mile in length, and, on arriving at El Pardo, the cars carrying the Royal Family drew up in front of the Palace, the others passing along and saluting with their horns, while Princess Ena acknowledged their salutes from the balcony. Altogether it was a great day for the automobile. It has well shown how effectively it can bear its part in a public pageant, and how much it can add to the general interest of an event of the kind.

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The Present Trend of Invention. The Patent Office records for the year furnish an accurate gauge of the lines in which the minds of the inventive portion of the community have been running for the past twelve months—and previously. The Comptroller-General has now issued his report, and from this it appears, as might be generally anticipated, that it is to motor vehicles and their accessories that the principal attention of would-be patentees has recently been given. Genius has been particularly active, as our regular readers will not be surprised to find, with anti-skidding devices and puncture preventatives, though every branch of automobile construction is very well represented. While inventive activity has thus been concentrated on the car proper, it will be no surprise to most people to learn that there has been a regular slump in motor cycle inventions, while the designer of fantastic flying machines, which used to be such an entertainment to those familiar with Patent Office records (is it a result of the Wright Brothers' successes?), would seem almost to have retired from business. Just as ten years ago the cycle boom brought forth an amazing number of alleged "inventions" in regard to cycles, so at present history is repeating itself in regard to the automobile. When the new Patent Act came into force a year ago, we were one of the few journals to point out its advantages, and to maintain that it would probably be useful to the really *bona fide* inventor. It is therefore with satisfaction that we learn from the Comptroller's Report that *bona fide* applicants for patents have found the effect of the Act highly beneficial. Considering the enormous amount of labour and trouble which carrying out the Act has imposed upon the Comptroller and his staff, this is an admission of very marked significance.

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The Motor 'Bus in Hot Water. The hot water which flows in its circulating system is by no means the only sample of that liquid which the motor 'bus lately has found itself immersed in. It has been having quite a bad time of it all round, in the police courts, in the House of Commons, and in the correspondence columns of the daily papers, which, perhaps, as there are now well on the way to 500 motor 'buses running on the streets of the Metropolis, as all the drivers to whom these vehicles are entrusted are certainly not as expert as they might be, and as there are many cases in which little has been done to mitigate the oil, smoke, and noise nuisances, is no great wonder. Indeed, the general irritation has reached the calm precincts of the Courts of Justice, and Mr. Justice Joyce is so annoyed over the whole situation, that he, last Saturday, said, while a case was being tried before him, "We do not want any more motor omnibuses on the streets," and refused to make an order which was likely to result in an addition of another four vehicles to those already running.

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And in Parliament. In Parliament a question was asked by Mr. Stephen Collins, who put the query to the President of the Board of Trade as to whether four persons had been killed in one week in Walworth Road by motor 'buses, a statement which appears originally to have been due to the Rev. Vicar of St. John's in that suburb. The whole matter, Mr. Lloyd George informed his questioner, was under consideration. Then there was Mr. Weir, who loves not any form of automobilism, and he extracted from Mr. Gladstone some further statistics in regard to accidents which are far from favourable. In one month, that is April last, all the horse omnibuses of the Metropolis produced between them 265 accidents. The accidents put down to motor omnibuses totalled up to 424, or very nearly one per 'bus per month. The proportion of deaths is almost worse, one being set down against the horse 'bus and three against the motor 'bus. These figures must, no doubt, be considerably discounted, as they make no attempt to distinguish between accidents caused by the driver's fault and those due to the victim's negligence, but still the indictment is a serious one. We shall probably not be far wrong in attributing it to the undoubted fact that motor 'buses have been put upon the streets of London with greater rapidity than drivers can be trained to manage them properly. In fact, considering the manifest inexperience of many of the drivers, the fact that accidents and mishaps are not much more frequent and numerous than they are forms a very favourable testimony to the controllability of the vehicles.

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The Motor 'Bus Strike. Under these circumstances, the acute situation, and the strained relations which have recently existed between one big motor 'bus Company and its drivers and conductors really possesses an almost comic opera air. As we anticipated in our last issue would be the case, the discontent of the drivers and conductors with the conditions under which they have been working, resulted in an actual strike, and though the Managing Director of the Company has apparently been anxious to minimise matters, there was an inconsiderable number of the Vanguard 'buses running on Monday morning last. The situation is, as we say, apparently thoroughly absurd, not only as we have here an example of a perfectly new industry manifesting all the troubles of an old one, but as the supply of good drivers is admittedly inadequate. Under such circumstances one would anticipate that any reasonable Company would rather stretch a point to meet the demands of their employees than otherwise, and as we have already stated, the demands themselves appear to have been thoroughly reasonable. They referred, we understand, to three main points—the question of wages, the number of hours of employment per day, and the propriety of the Company fining drivers and conductors when a 'bus either breaks down or does not earn as much during the day as it is thought it ought to do.

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A Question of Public Interest.

The question of wages is, of course, one entirely for the drivers and conductors and their employers to settle between themselves, though, as we said last week, considering the earning power of a motor 'bus and the immense responsibility of managing it, 7*s.* a day for the driver and 6*s.* for the conductor seems to be far from exorbitant. But the other two points in dispute are of direct interest to the safety of the public. Everyone who knows anything about London knows that the regular passengers of motor 'buses assemble in small crowds at the usual stopping places. The 'bus that comes up first scoops the pool. Now we are always being told that the companies do all in their power to discourage racing by their drivers, and that their garages are papered with notices prohibiting this reprehensible practice, but it is quite plain that these notices must be rendered nugatory if the drivers are to be fined for diminished earnings. The driver's best and easiest way to escape being fined is to make every run from one stopping place to another a race, and a race that he takes good care to win if he possibly can. The number of hours for which the driver is employed is of scarcely less moment to the safety of the travelling public. Anyone with experience of driving any kind of automobile through London traffic will recognise that a nine hours' day, that is to say, eight actually at the wheel, is as much as average nerves should be called upon to stand. If you make a driver work longer, it is simply risking the lives of the 33 passengers behind him. The whole position, therefore, considering the apparent reasonableness of the men's demands, has been much more a question of safety of the travelling public than one of mere dispute between a company and its employees.

The "Yellow Cover" and the Tramp.

"THE contents bill of a motor journal runs as follows:—'95 miles on two gallons.' Tramps have been seen to read it and turn away with tears in their eyes, murmuring that it could not be done."—*Evening News.*

The Academy Motor.

QUITE a lot of fuss has been made about the picture—not infrequently termed "The Portrait of a Motor Car"—which adorns the walls of this year's Academy Exhibition. It is difficult for the motorist, and we think we might add also the artist, to comprehend the reasons for this enthusiasm. A lady is buttoning up her glove in a distinctly awkward attitude in front of a motor car, which the artist has represented on such a scale that it more than fills the whole of his canvas, and he has had in consequence to cut off half the tonneau. A gentleman in an attitude of negligent ease occupies the driving seat, and his two sons are in the tonneau. It is with almost a feeling of distress, remembering our "Cars and How to Recognise Them," that we find a volatile journalist, suffering apparently from a bad attack of mixed metaphor, has described the vehicle as a "Daimler of the Ukraine breed."

MOTOR UNION BIRMINGHAM MEET.—Midland A.C. Gymkhana. A group of officials and others in the Committee Enclosure. Reading from left to right are Earl Russell, Messrs. C. H. Dodd (Vice-Chairman Motor Union), A. McAlpin (Sec. Leicestershire A.C.), A. Scrase Dickens (Chairman Sussex County A.C.), A. Armitage (Hon. Sec. Somerset A.C., A. Atkey (Notts. A.C.), Hon. Arthur Stanley, M.P. (Chairman of Motor Union and A.C.G.B.I.), E. Shrapnell Smith, and A. A. Dale.

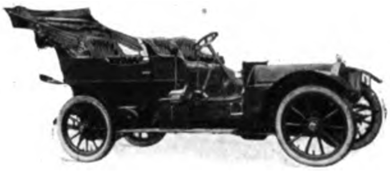
How to Recognise the Cars of To-day.

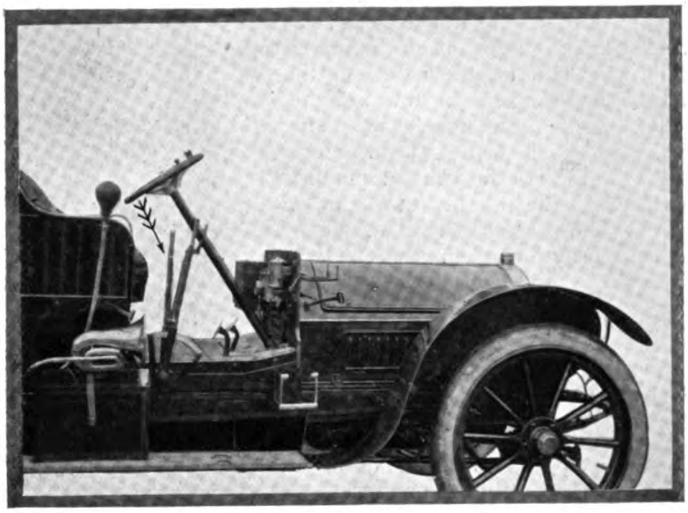
(No. 33.)

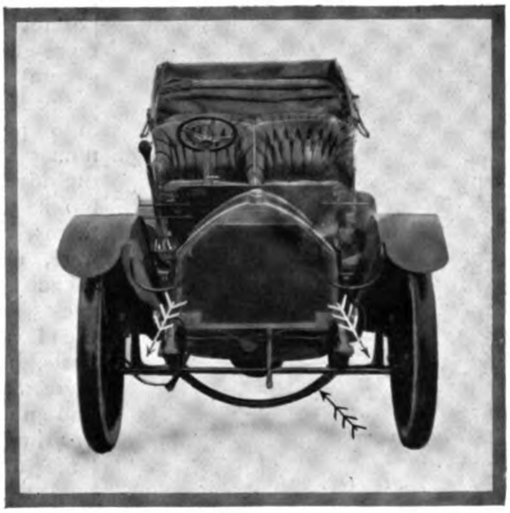
The Germain

(BELGIAN)

16, 24 & 35 H.P.

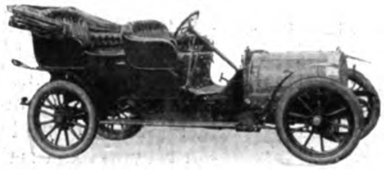






On the larger models the BONNET is of a modified Mercédès type, but having a more POINTED TOP. Another conspicuous feature, however, is the FRONT AXLE, which is considerably curved in the middle. The CHANGE-SPEED LEVER works on a straight-through quadrant, but has no trigger.

* * *

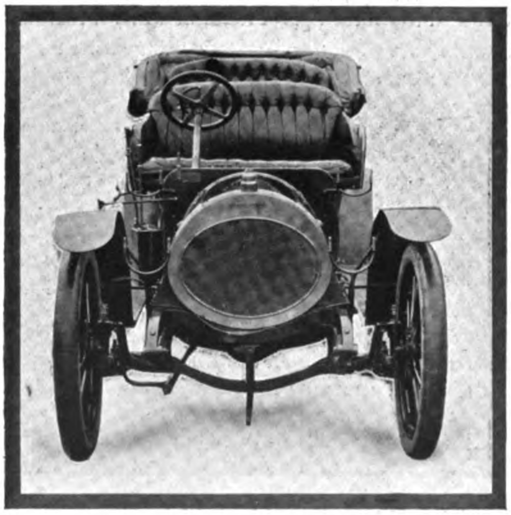


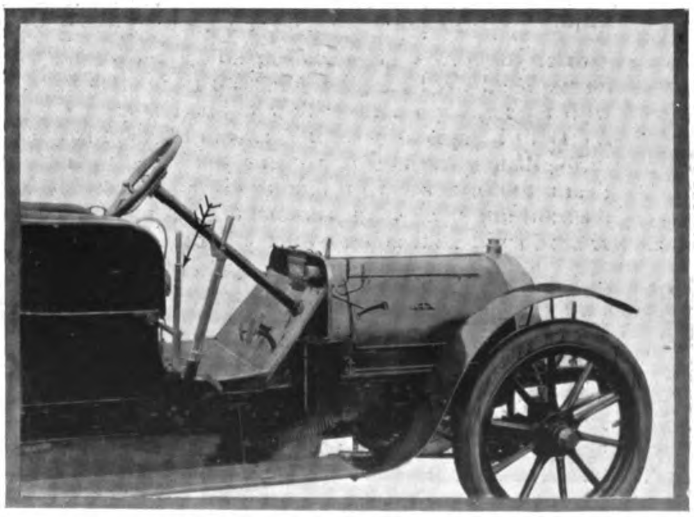
(No. 34.)

The Germain

(BELGIAN)

14-22 H.P.





An OVAL-SHAPED RADIATOR distinguishes the small Germain model, but this car can also be recognised by the change-speed lever, with its straight-through quadrant.

MOTOR UNION MEETING IN BIRMINGHAM.

FOR three of the summer months the Motor Union hold meetings in the provinces, and the first of these to take place this year was that held at Birmingham on Saturday last, when the Midland Automobile Club constituted themselves hosts for the occasion. As each of the important clubs is represented on the general committee of the Motor Union in proportion to its numerical strength, the Midland Automobile Club found themselves, as it were, in the dual capacity of guests as well as hosts, but there was also an exceedingly large and representative gathering from all parts of the kingdom. Earl Russell, Messrs. F. Coleman, P. W. Northey, and F. J. Sharpe attended on behalf of the A.C.G.B.I., while members of the Birmingham, Derby, Essex, Herts, Leicestershire, and Manchester Clubs, together with representatives from many other provincial clubs, were also in evidence, and held their business meeting as the General Committee under the genial chairmanship of the Hon. Arthur Stanley, M.P. On the previous evening the Grand Hotel had also been used as the meeting place for the General Purposes Committee, which was conducted under the chairmanship of Mr. G. T. Langridge, supported by Earl Russell, on behalf of the A.C.G.B.I., and members from the various other clubs represented. Mr. Rees Jeffreys, the energetic secretary of the Motor Union, was unfortunately prevented from attending until late in the evening, on account of an accident which he had sustained near Oxford while travelling down hill on a greasy road. Happily, however, the effects were not as serious as might have been expected considering the nature of the mishap, and he was not prevented, therefore, from taking part in the proceedings, although he was compelled to keep his arm in a sling.

The Hon. Arthur Stanley, M.P., Chairman of the Motor Union and A.C.G.B.I.

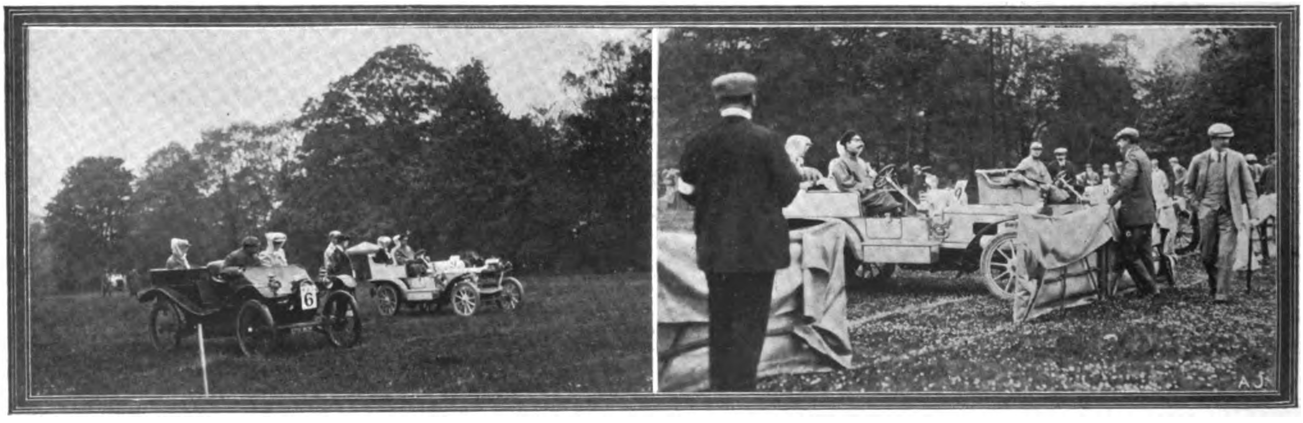
Mr. W. Rees Jeffreys, the Secretary of the Motor Union.

By way of entertaining their guests the Midland Automobile Club considered that they could not do better than make this visit the occasion of their annual dinner, whilst, in addition, they organised a gymkhana as a pastime for the afternoon.

Earl Russell watching the progress of events.

The Gymkhana at Moseley.

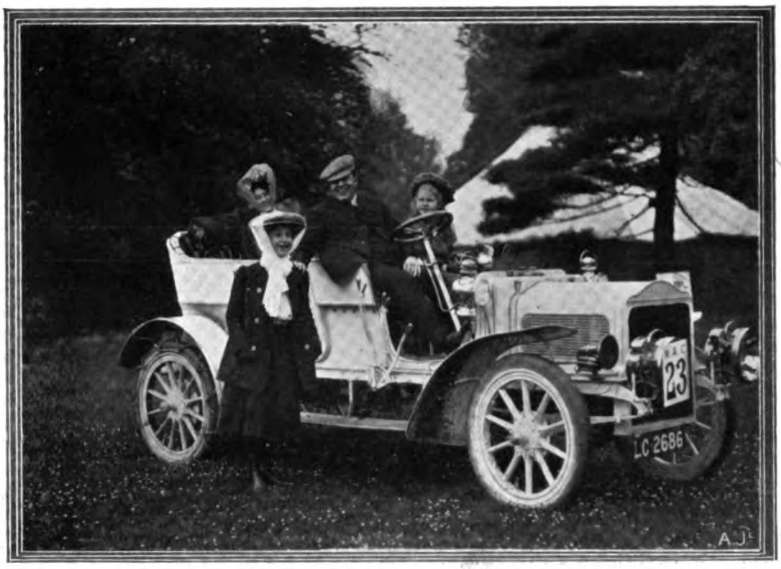
One of the most successful gymkhanas which has yet been organised was that which the Midland Club inaugurated last year in aid of the funds of the Moseley Convalescent Hospital, near Birmingham, and the second gathering last Saturday fully justified the trouble which the club had gone to in order to make such an event as attractive as possible. One of the best features about a gymkhana is that it can be appreciated by people who are not otherwise interested in motoring, for it is not difficult to devise



Starting. Stopping at the "brick" wall.

MOTOR UNION BIRMINGHAM MEET.—Midland A.C. Gymkhana. Starting and Stopping Race. Competitors start from the line, race over a straight course and terminate over a line without touching a "brick" wall.

contests of an exceedingly varied and amusing character. Being entirely conducted within such a very limited area, the spectators have always something to look at, and are not compelled, as is too often the case at race meetings, to sit for long periods while absolutely nothing is going on. When watching an ordinary road race, too, it is often exceedingly difficult to tell how the event is progressing, and it must be admitted that it can only be the result of an acquired taste to be able to evince any very great interest in the mere passing of a car every quarter of an hour or so. In such a contest as that which took place at Birmingham, however, there was nearly always something of interest to watch in each individual competitor's performance. In the second event, for instance—which was a ladies' passenger race—each entrant had to drive a distance of 75 yards, alight, assist a lady from a chair on to the front seat of the car, drive a further 75 yards, alight, and assist a second lady from a chair to the back seat of the car, after which the driver had to remount and return to the first seat from which he had to assist yet another lady to her appointed seat, and finally drive off to the finishing point. It was a *sine qua non* that the ladies should not rise from their chairs until the driver took them by the hand to assist them into the carriage, and, naturally enough, not the least interesting feature of the race was the amusing results brought about by the impatience of the motorists who were endeavouring to show most aptitude in their double *rôle*. Some competitors, indeed, lost all chance of success by prematurely stopping their engines, others, however, allowed them to race horribly. It was Mr. Lanchester who ultimately secured the first prize, Mr. E. M. C. Instone making a good second with his Daimler. The ladies who were called upon to play such an active part in this event were not forgotten, and prizes were also awarded to Mrs. Lanchester and the Misses Thomas, Barnsley, Greaves, Barnard, and Davis.



MOTOR UNION BIRMINGHAM MEET.—Midland A.C. Gymkhana. Mr. Frederic A. Coleman, on his 18-h.p. White steam car, and his load are highly amused after finishing the Ladies' Passenger Race, in spite of being unable to start in the final.

But for an accident to his engine, Mr. Frederic Coleman would in all probability have been successful with his White steamer in this event, for he won his heat in fine style, and demonstrated the rapid acceleration of his car to the no small deterioration of the turf.

A starting and stopping race preceded the event just described, and in this the competitors had to race over a straight course and pull up beyond a line situated at a short distance from a "brick" wall. Mr. E. W. Lewis won this race with a 16-h.p. Rover, Mr. G. H. Lanchester being the second, with his 12-h.p. car. There were still two other events on the programme, one an Obstacle Race, the other being called "Musical Chairs." In the former, the competitors had to start from a line and drive down a course strewn with a varied assortment of obstacles, at the end of which they had to turn round and once more find their way back to the starting-point. In this event, Mr. S. Downing was successful with a 10-h.p. Alldays, while the little 6-h.p. Jackson, driven by Dr. G. S. Moore, came in second. "Musical Chairs," was, as its name implied, a motor car version of the well-known children's pastime. Each car carried one lady passenger, and all the entrants had to drive round the ring, during which time the band continued to play some popular air—the tune, unfortunately, being not always audible to the spectators, owing to the "music" of the numerous engines. When the band suddenly stopped playing, the lady passengers had to alight and sit on chairs in the centre of the ring, the drivers remaining meanwhile at their posts. This proved an exciting contest, and resulted in a victory for Mr. G. N. Guilding's 10-h.p. Star car, or rather, it would be more appropriate, and only just to say the victory was won by the lady passenger in that vehicle. After these events, which were favoured

MOTOR UNION BIRMINGHAM MEET.—Midland A.C. Gymkhana. A few of the interested inmates of the Moseley Hall Convalescent Home in aid of the funds of which very deserving hospital the Gymkhana was held.

The Obstacle Race. Mr. E W. Lewis' 16-h.p. Rover starting. Driving backwards through the obstacles. G. S. Moore's 6-h.p. Jackson.

MOTOR UNION BIRMINGHAM MEET.—Midland A.C. Gymkhana.

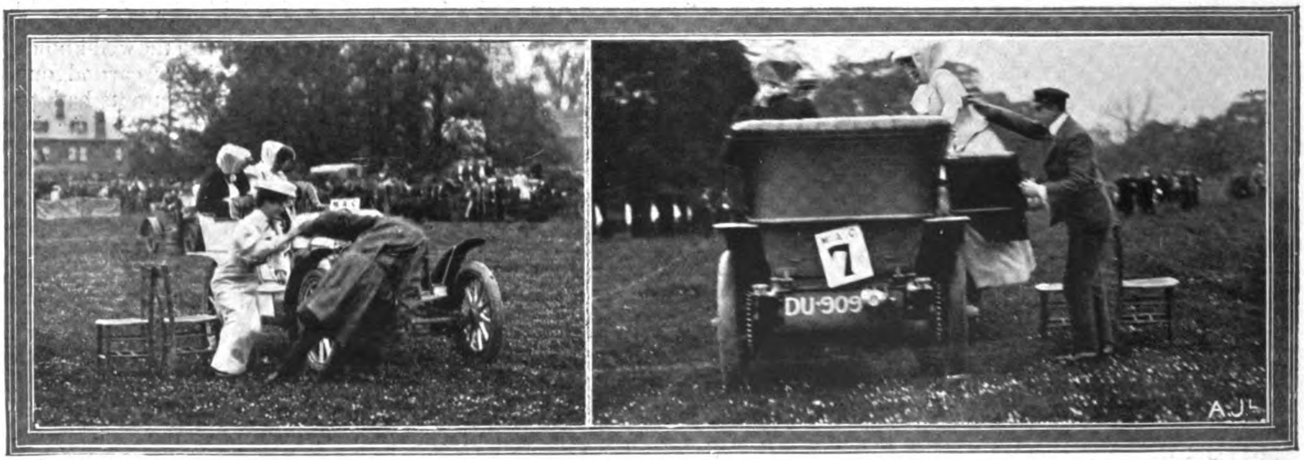
throughout with fine weather, the prizes were presented by the Hon. Arthur Stanley, M.P., Chairman of the Motor Union and Automobile Club, and the competitors and others then bethought themselves of the banquet which was to conclude the day.

The Banquet.

Mr. J. Broughton Dugdale presided at this function, and was supported by Earl Russell, the Hon. Arthur Stanley, M.P., and a representative company of motorists from the Midland district The chairman, in proposing "The Motor Union," expressed in eulogistic terms the appreciation which the members of the Midland Automobile Club and others in surrounding districts felt for the work which the Motor Union was doing on behalf of the industry generally. This toast was responded to by the Hon. A. Stanley, M.P., who referred with great satisfaction to the recent agreement which has been entered into by the Motor Union and the Automobile Club. Referring to the present Act, Mr. Stanley expressed it as his opinion that when legislation came it would be of a permanent character, and that it seemed as if the deferring of this important time would prove an advantage in ultimately securing a satisfactory Bill.

MOTOR UNION BIRMINGHAM MEET. **Midland A.C. Gymkhana. Mr. T. H. Ryland, Hon. Secretary of the Midland A.C. (on the left), the Hon. Arthur Stanley, M.P., Chairman of the Motor Union and A.C.G.B.I., and Mr. Lindus Forge, Hon. Sec. of the Essex County A.C., watching the contest.**

The toast of "The Midland Automobile Club" was proposed by Mr. A. R. Atkey, who told the amusing anecdote of a schoolboy who likened motoring to "the quick and the dead." "The quick," said the boy, ' are those who get out of the way; those who don't are the dead." Captain Anson, the Chief Constable of Staffordshire, was, unfortunately, unable to be present, but he had considerately written a letter, saying that the complaints in reference to motorists were decreasing. The duties of policemen would be reduced to a minimum, he added, if every motorist would negotiate corners on the assumption that he would meet an old lady in a Bath chair.



MOTOR UNION BIRMINGHAM MEET.—Midland A.C. Gymkhana. Different methods of securing the "freight," in the Ladies' Passenger Race.

THE CLEMENT-TALBOT PETROL CARS.—PART IV.

The 20–24-h.p. Engine.

FIG. 18 is a longitudinal section, and Fig. 19 a transverse section of this new all-British engine, other views of which, reproduced from photographs, are given in Figs. 16 and 17. Two aluminium castings, which are bolted together by long bolts on either side of the main bearings, as well as by short bolts around the outside, constitute the crank-chamber, and these not only provide bearings between each of the crank-pins, but enable inspection-doors to be fitted beneath each crank-pin. At the front end, the main castings form one-half of a separate casing, inside which are fitted the gear-wheels that drive the two cam-shafts as well as the centrifugal-pump and the magneto. The remainder of this casing is formed by a detachable cover.

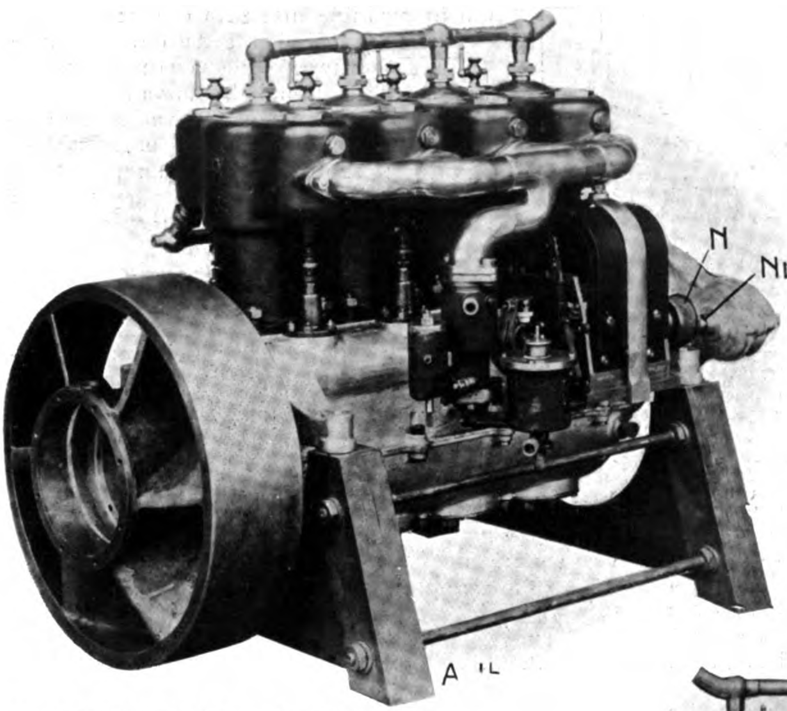


Fig. 16.—The 20-24-h.p. British-built Clement-Talbot Engine. View from the right-hand side, showing the Carburettor, and the high-tension Magneto with its speed-reducing gear. At the time that our photograph was taken, neither set of Ignition-plugs were fitted, but these usually pass through into the Inlet-valve-chambers, one set lying horizontal and the other set vertical.

Through the upper half of the crank-chamber two clear passages are bored from end to end to enable the cam-shafts, M, together with their bearings, M^1, to be slid into place from the front end. These bearing brasses, M^1, are of slightly increasing diameter towards the front, so as to enable them all to slide into place quite easily, and each of them is subsequently prevented from moving by means of a grub-screw, M^3, fitted in from the outside. It will be noticed that in this manner exceedingly long bearings are obtained, these bearings in fact fitting up close to the cams, M^2, so as to support the shafts throughout almost their entire length. The cams themselves and the gear-wheels are secured to the shaft by keys, as well as by taper pins. A cam-shaft, complete with its brasses and cams, is shown separately in Fig. 20.

Over the cams, the push-rods with their steel rollers and small cushioning springs are fitted in place from above, and the push-rods have adjustment-nuts for enabling the valves to be set accurately. The exact construction of these various parts is clearly indicated in our line drawings.

Two interesting features in connection with the crank-shaft are, that it is made of Chrome-Vanadium steel, and also that it has a bearing formed between each cylinder, as is well illustrated in Fig. 18. On either side of the main bearing in front of the engine, there are ball-thrust-bearings, L^5, and beneath each of the connecting-rods there are small oil-scoops, L^6, formed by short lengths of piping that tend to force the oil up into the big-end bearings. These small pipes also serve to hold the lower halves of the brasses in place. At the upper ends of the connecting-rods, the gudgeon-pins are prevented from moving endways in the pistons by means of extra wide, additional piston-rings that pass round their ends, thus dispensing with any of the usual methods of fixing the gudgeon by screws inside the piston. Comparatively little need be said by way of explanation of the arrangement

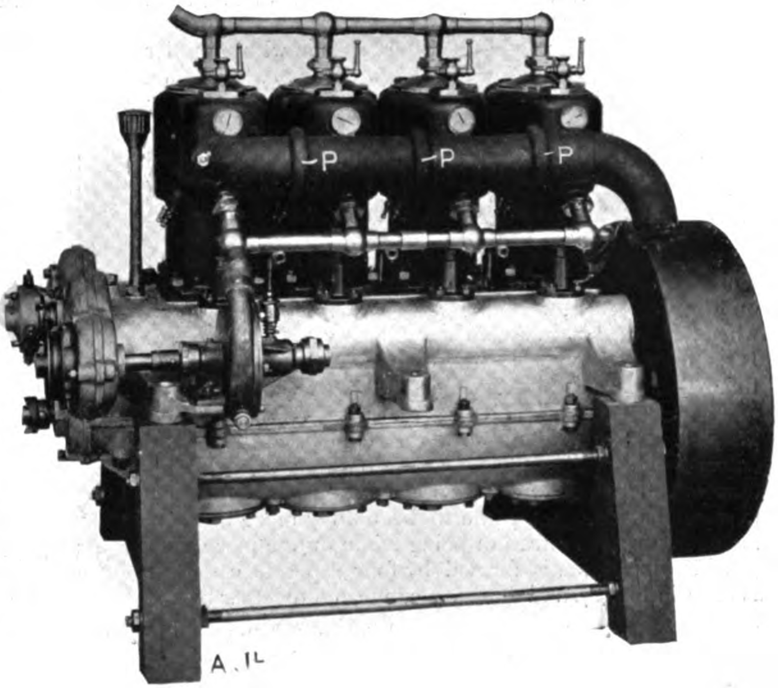


Fig. 17.—View of the 20-24-h.p. Clement-Talbot Engine from the left side, showing the Centrifugal Pump, and also the special Exhaust-pipe-fitting with its expansion joints (P).

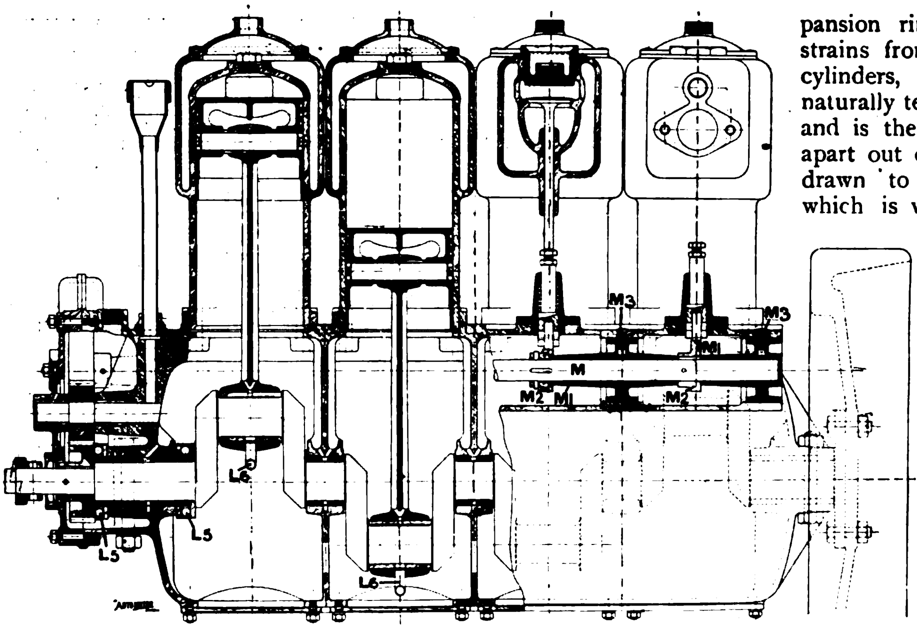


Fig. 18.—Longitudinal Section of the 20-24-h.p. Clement-Talbot Engine.

of the valves, or of the water-jackets with their pipes, for all these parts are most clearly indicated graphically. Attention should, however, be drawn to the fact that horizontal ignition-plugs are fitted through the walls of the inlet-valve-chambers, in addition to the vertical plugs that pass through the inspection-caps above the inlet-valves, one set of these plugs being used in connection with the high-tension magneto, and the other set being operated by a battery system with trembler coils. In Fig. 16, neither set of ignition-plugs is visible, for they were not fixed in place at the time that our photograph was taken. Any type of magneto can be fitted, for the shaft that drives it runs at the same speed as the *crank-shaft*, and a neat additional two-to-one reduction-gear has been got out by the Clement-Talbot Company to suit Simms-Bosch magnetos, which run, as is well known, at the same speed as the *cam-shaft*. This neat little reduction-gear, which has a spur-wheel on the shaft, N^1, meshing with an internally-toothed wheel, N, on the magneto spindle, is visible in Fig. 16. It is rendered oil-tight by a cover, and is in practice filled with grease.

The only other special point to which reference need be made in connection with this engine, concerns the exhaust pipe fitting, into which the burnt gases from all four cylinders are led. It is a particularly important matter, that has not hitherto been fully recognised on many engines. Instead of being made in one piece, this exhaust pipe fitting is formed by four separate castings, as seen in Fig. 17, and these are connected together by expansion rings, P, in order to prevent any strains from being imposed by it on the cylinders, when hot. An ordinary fitting naturally tends to expand when it gets hot, and is therefore apt to force the cylinders apart out of line. Attention, too, might be drawn to the branched induction-pipe, which is visible in Fig. 16, as it tends to equalise the effective distance between the automatic carburettor and all four valves.

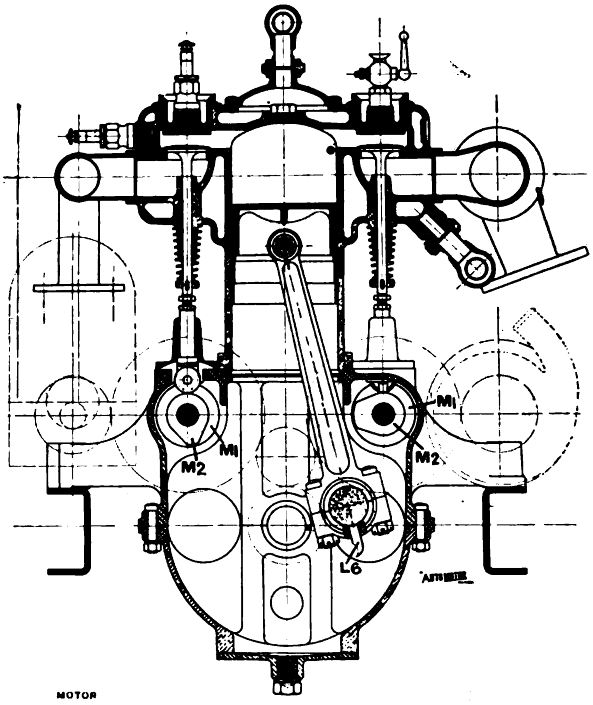


Fig. 19.—Transverse Section through the 20-24-h.p. Clement-Talbot Engine, showing the arrangement of the Valves and of the high-tension Ignition Plugs.

This engine has a bore of 100 mm., and a stroke of 120 mm., the normal speed being 1,000 revs. per min. As will have been recognised, it has no automatic governor, the power and speed being controlled entirely by the driver.

It is fed with oil from a sight-feed lubricator on the dashboard, and the throttle-valve is so connected with the clutch-pedal that the engine is automatically prevented from racing when the clutch is withdrawn.

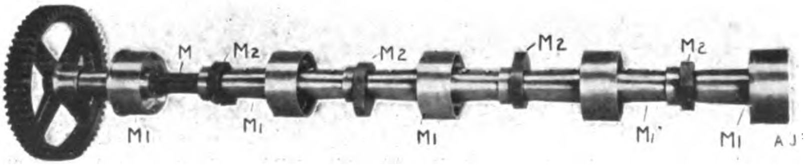


Fig. 20.—View of one of the Cam-shafts for the 20-24-h.p. Clement-Talbot Engine, showing the long bearing Brasses that enable it to be withdrawn longitudinally, and that normally support it throughout the greater part of its length.

The Brakes.

Both the hand-operated hub-brakes and the foot-brake are of similiar construction, with steel shoes of a specially treated character that are forced outwardly against the inner face of a malleable drum by a kind of double cam that is carried on the

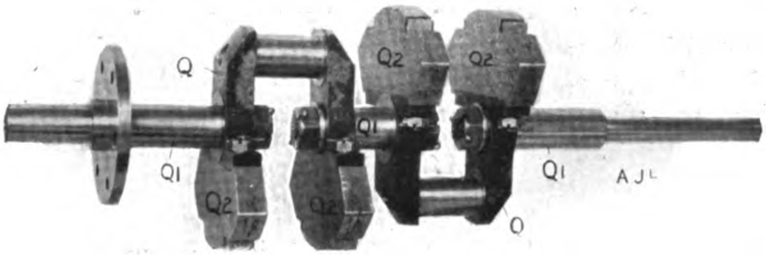


Fig. 21.—View of a specially built-up Crank-shaft for a twin cylinder Clement-Talbot Engine, the unusual feature being that the Crank-pins are solid with the Crank-cheeks, and that they can be easily hardened.

rock-shaft. The shoes are normally held clear of the drum by helical springs, which also hold them in place about their fulcrum-pin. As already mentioned, the hub-brakes are compensated by a swinging link, and the foot-brake is operated by a rock-shaft (visible in Fig. 10) which lies alongside, and is carried by, the gear-box.

Around the brake-drum, F^6, are ratchet-teeth, with which a pawl can be made to engage in order to avoid any risk of the car running backwards if the car should come to rest on a hill.

A New Form of Crank-Shaft.

A telling example of the thorough manner in which Mr. Garrard and his staff at the Ladbroke Grove works are constantly studying ways and means, in their endeavours to improve their vehicles, is to be found in the built-up crank-shaft, of which we give an illustration in Fig. 21. This particular shaft is designed for a twin-cylinder engine, but the same principle might be adopted for 4-cylinder engines.

There are two important points about this shaft, one being that it enables the crank-pins to be hardened without fear of distorting the shaft in any way, and the other being that a perfectly true crank-shaft can be constructed at a reasonable price without the drawbacks that have hitherto been associated with most "built-up" crank-shafts. It will be noticed that each of the forgings, Q, constitutes one crank pin complete with its crank-cheeks, and also that the crank-pins themselves are bored out hollow. The first of these facts means that the building-up process is simply a matter of securing the different portions of the shaft, Q^1, to the forgings, Q, in such a way that they are true with one another, and this is not further complicated by having to fix separate crank-pins to separately-formed crank-cheeks.

Taken in conjunction with the fact that the crank-pins are hollow, there is also the great advantage that the finished forgings, Q, can be hardened without difficulty by means of the same plant that is used for all other special parts of the Clement-Talbot cars.

The leading feature of their hardening process is that the piece under treatment is cooled from the centre outwards, instead of from the outside inwards, and that thus practically no twisting can occur.

It is for facilitating the subsequent grinding of the crank-pins that the counterweights, Q^2 are bolted in place, instead of being made in one piece with the forgings, Q, for otherwise the grinding-wheel would have to be of unwieldy size.

Table of Reference Letters for the Clement-Talbot Illustrations.

	Cone Clutch.
A	Spring-plates.
A^1	Cavities for A.
A^2	Helical springs.
A^3	Adjustment nuts.
A^4	Leather face.
	Battery and Magneto Switch.
B	Main casting.
B^1	Operating rod.
B^2	Sliding sleeve.
B^3	Contact arms (H.-T.).
B^4	Contact arm (L.-T.).
B^5	Central contacts.
B^6	Magneto contacts.
B^7	Battery contacts.
	Steering-Gear.
C	Travelling nut.
C^1	Steering lever-arm.
C^2	Adjustment collar.
C^3	Tube for quadrant.
C^4	Quadrants for hand-levers.
C^5	Tube for levers, C^6 and C^7.
C^6	Hand lever.
C^7	Lever-arm.
C^8	Rod for levers C^9.
C^9	Hand lever
	Live Rear Axle.
D	Central castings.
D^1	Flanges on axle tubes.
D^2	Axle tubes.
D^3	End castings.
D^4	Spherical rings.
D^5	Spring-brackets.
D^6	Tie rod.
D^7	Flange for tube D^4.
D^8	Tube enclosing shaft E.
E	Propeller-shaft.
E^1	Bevel-pinion.
E^2	End bearing.
E^3	Bevel wheel.
E^4	Differential casing.
E^5	Ball-bearings for differential.
E^6	Locking keys for E^5.
E^7	Ball-thrust-bearings.
E^8	Planet-carrying spider.
E^9	Axle shafts.
E^{10}	Ball-bearings for E^9.
	Universal Joint.
F	Forked Forging.
F^1	Swivel pin.
F^2	Intermediate forging.
F^3	Sleeves for F^2.
F^4	Casting on shaft G.
F^5	Brake-drum.
	Change-Speed-Gear.
G	Axle-driving shaft.
G^1 G^2 G^3	1st, 2nd, and 3rd-speed gear-wheels.
G^4	Internal-gear-wheel.
G^5	Ball-thrust collar.
G^6	Inner flange.
H	Clutch-driven shaft.
H^1	Spur-wheel on H.
H^2	Bearing cage for H.
H^3	Thrust-bearing for H.
H^4	Direct-drive jaw-wheel.
H^5	Coupling.
H^6	Flanged coupling-piece.
J	Lay-shaft.
J^1	1st-speed wheel.
J^2	2nd-speed wheel.
J^3	3rd-speed wheel.
J^4	Reverse wheel.
J^5	Driven wheel on lay-shaft.
J^6	Reverse wheel meshing with G^1.
J^7	Reverse wheel meshing with J^4.
	Multiple Disc Clutch.
K	Clutch-shaft,
K^1	Disc carrying drum.
K^2	Friction discs.
K^3	Sliding member.
K^4	Clutch spring.
K^5	Coupling.
K^6	Corrugated separating rings.
K^7	Thrust collar.
	Crank-Shaft and Fly-Wheel.
L	Crank-shaft.
L^1	Fly-wheel casting.
L^2	Cover casting.
L^3	Guide pins.
L^4	Friction discs.
L^5	Ball-thrusts in crank-chamber.
L^6	Oil scoops on connecting-rods.
	Cam Shafts.
M	Cam-shafts.
M^1	Bearing bushes.
M^2	Cams.
M^3	Grub-screws.
	Magneto Reduction Gear.
N	Internally-toothed wheel.
N^1	Shaft carrying pinion.
	Expansion Joints.
P	Joints in exhaust-pipe-fitting.
	Built-up Crank-Shaft.
Q	Crank forgings.
Q^1	Portions of shaft.
Q^2	Counter weights.

* * *

The Anti-'Bus Racing Campaign.

The campaign against 'bus racing, the evils and dangers of which have so persistently been referred to in The Automotor Journal, has been energetically taken up at last, we are glad to see, by several companies, and the London Power Omnibus Company and the London Road Car Company now exhibit boards on their 'buses warning drivers that racing is forbidden. Messrs. Tillings, too, and the London Omnibus Company have given their drivers the strictest injunctions never to indulge in the reprehensible pastime. Messrs. Tillings, in fact, go so far as to state that any driver who is found guilty of racing renders himself liable to instant dismissal. This is as it should be, but the root of the evil seems to lie in the fact that there is an incentive for the drivers to reach those corners at which passengers congregate in front of their rivals.

THE AUSTIN PETROL CARS.—PART V.

(*Concluded from page* 639.)

The 25-30-h.p. Engine.

An excellent idea can be obtained of the engine from Figs. 19 and 20, where it is shown fixed in place in the chassis. In the former view—which is taken from the right side—it will be noticed that each cylinder is formed by a separate casting, and that the ignition-plugs are situated above the inlet-valves on that side. These ignition fittings are unusual inasmuch as they not only constitute low-tension make-and-break igniters for the magneto system, but that the high-tension ignition-plugs for the alternative battery system are screwed into the same castings, instead of being fitted into the cylinders independently. The carburettor, S^1, which is of the well-known "Krebs" type, occupies a position immediately above the branched induction-pipe, and has its automatically-controlled throttle-valve coupled up to the centrifugal governor, S, which—on the "Austin" engine—is mounted on the same shaft as the fan, and is subject to the control of an accelerator-pedal only.

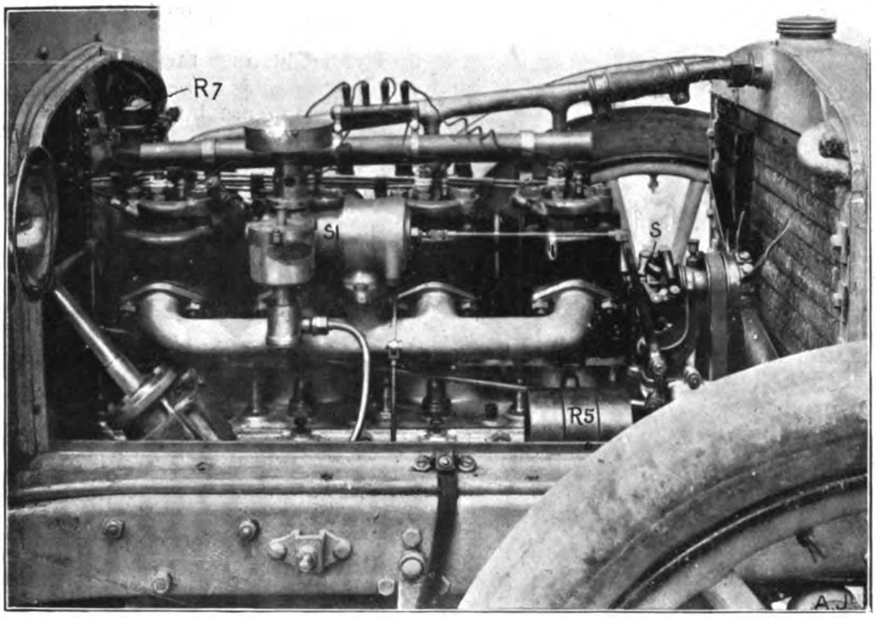


Fig. 19.—The 25-30-h.p. "Austin" Engine fixed in place in the chassis. View from the right side, showing the positions of the governor (S), the Krebs carburettor (S^1), the low-tension magneto (R^5), and the commutator (R^7), for the high-tension battery system.

The magneto, R^5, which is gear-driven from the cam-shaft that operates the inlet-valves and the igniters, can also be seen in Fig. 19, as also the commutator, R^7, and the chain which drives the mechanical lubricator on the dashboard. It may here be mentioned that the commutator, R^7, is carried on the top of a vertical shaft, at the lower end of which is a small pump for lubricating the moving parts inside the crank-chamber. Another fitting which can also be seen is the hand-controlled throttle-valve that is connected to one of the small levers above the steering-wheel. On the other side of the engine are the exhaust-valves and the specially constructed exhaust-pipe-fitting, T, which has stuffing-boxes introduced between each of its four independent parts in order to allow for expansion and contraction. The actual construction of this fitting is seen sectionally in Fig. 21, where it will be noticed that glands, T^2, press up against asbestos packing rings, T^1, in order to make gas-tight joints, but to allow for any relative motion that may be necessary with varying temperatures. Inside the fitting, there are also small baffles, T^3, to prevent the exhaust-gases from one cylinder from interfering with the free passage of those emitted from the other cylinders. Fig. 20 also enables the position of the centrifugal-pump, P^8, to be seen, this pump being driven by gearing in exactly the same way that the magneto is driven on the right side.

Attention might, too, be drawn to the lubricating pipes which lead to each of the four cylinders, and to the end bearings of the crank-shaft, these pipes passing along above the cylinder heads from the lubricator on the dashboard.

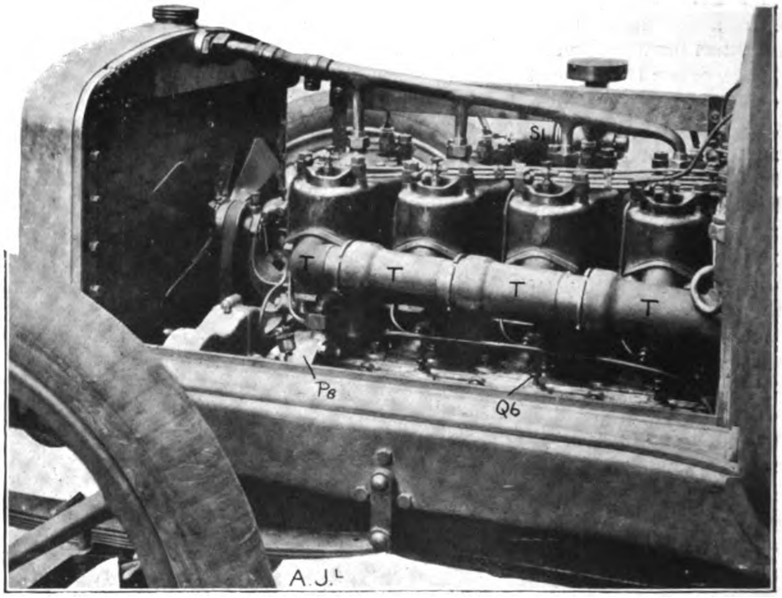


Fig. 20.—The 25-30-h.p. "Austin" Engine fixed in place in the chassis. View from the left side, showing the exhaust-pipe fitting (T), with its expansion joints, the adjustment screws (Q^6) for "timing" the exhaust-valves, the gear-driven water pump and the oil-pipes that are led from the chain-driven lubricator on the dashboard to the four cylinders and to the two end-bearings of the crank-shaft.

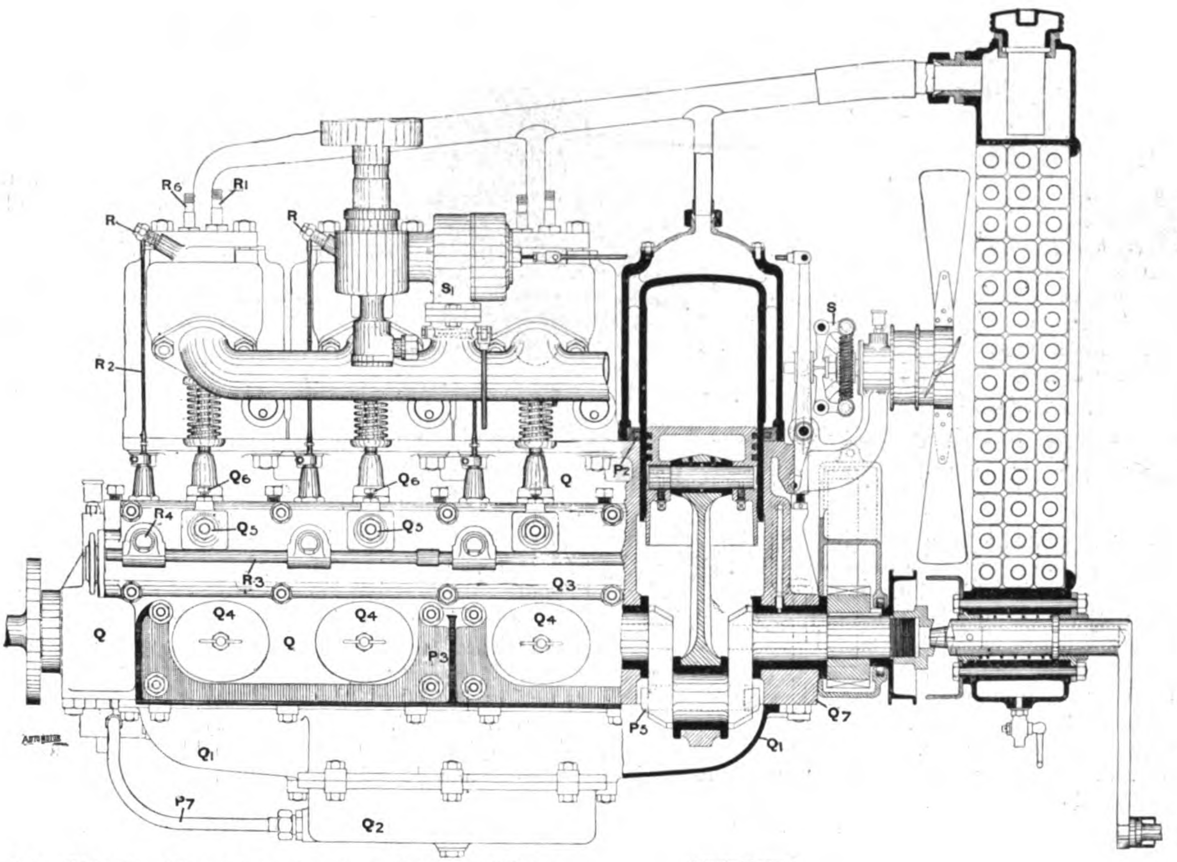


Fig. 22.—Side elevation and part section of the 25-30-h.p. "Austin" Engine with its radiator and starting-handle. In this drawing the engine is shown from the right side, upon which are situated the inlet-valves, with the low-tension igniters and the high-tension ignition-plugs above them. Also indicated are the governor (S), the carburettor (S^1), the oil-sump (Q^2), and the oil-catchers (P^5), for one of the crank-pins.

Even more important, from a constructional point of view, are those parts of the engine which cannot be seen in Figs. 19 or 20, and we therefore reproduce the two line drawings—Figs. 22 and 23—in which these features have been rendered specially prominent. The sectional views of the cylinder-castings indicate the method adopted for ensuring a total absence of all obstructions to the free flow of the cooling water through the jackets, as also for preventing any distortion of the cylinder itself owing to unequal expansion of the cylinder and of the jacket. The lower end of the jacket is, when first cast, entirely open, and is afterwards completed by means of the special joint-ring, P^2, which is screwed up in place inside it, and is rendered water-tight with the cylinder-wall by means of the "dermatine" packing-ring seen in the drawings. At its top end, the jacket is also cast with a large opening, which is subsequently completed by the dome-shaped fitting to which is coupled up the return water-pipe that leads to the radiator. Ultimately, therefore, a thoroughly water-

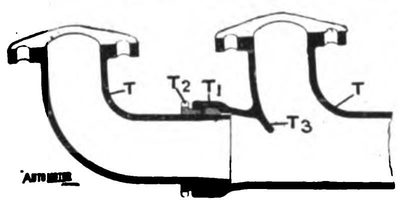


Fig. 21.—Sectional drawing of a portion of the "Austin" exhaust-pipe-fitting, showing the jointed form of construction that allows expansion and contraction to take place freely with variations of temperature.

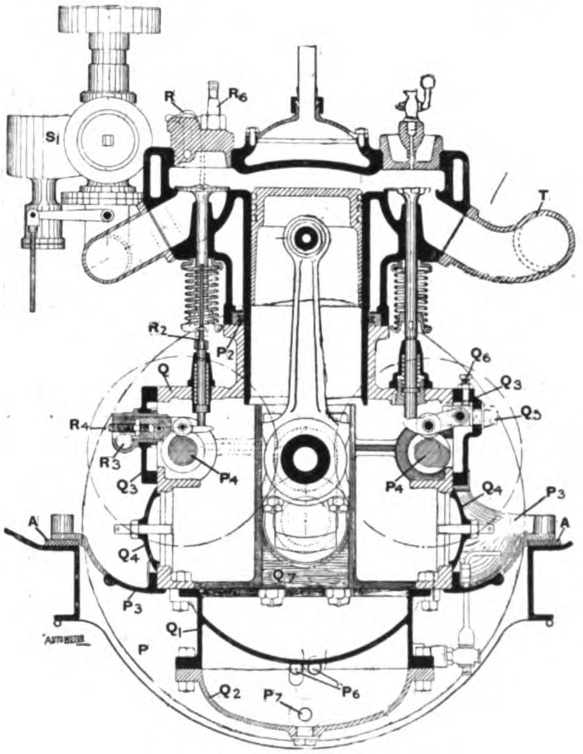


Fig. 23.—Transverse section of the 25-30-h.p. "Austin" Engine, fitted with its carburettor (S^1) and fixed in place between the side-members of the specially-shaped pressed-steel frame of the chassis. Clearly shown, are the joint-ring (P^2) for the cylinder-jacket, the adjustable operating-gear for the valves and igniters, the inspection-covers (Q^4) in the crank-chamber, and the oil-sump (Q^2) beneath the base-chamber (Q^1).

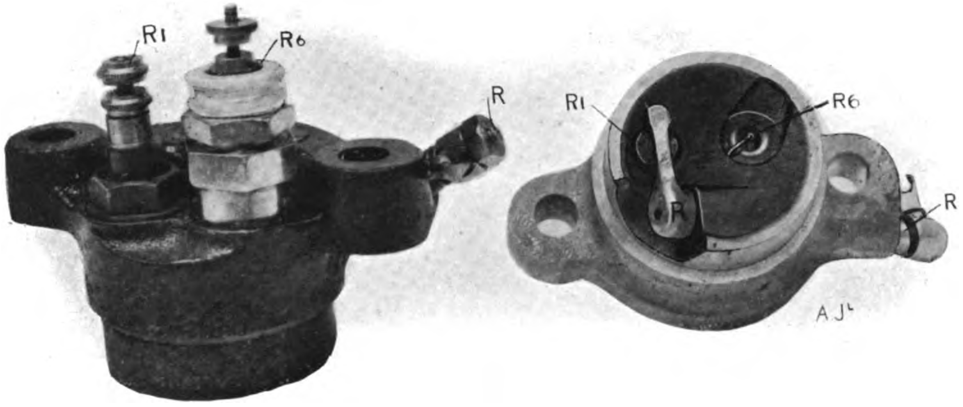


Fig. 24.—Two views of the combined low-tension igniter and high-tension ignition-plug fitting, which also forms the inspection-cover above the inlet-valves on the 25-30-h.p. "Austin" Engine.

tight jacket is ensured for each cylinder, and no risk is run of overheating from the presence of undetected air-pockets inside it. The inlet and exhaust-valves lie, it will be noticed, symmetrically on each side, and, being of the same size, are interchangeable.

One large aluminium casting, Q, forms the main portion of the crank-chamber, and it is owing to its shape that the cylinders have the appearance of being considerably shorter than usual. It is virtually rectangular in shape, and is so formed as to receive the five main bearings for the crank-shaft, and also those for the two cam-shafts, P^1. All these bearings are, indeed, rendered rigid with it, and are thus quite independent of the base chamber, Q^1, which can consequently be taken off at any time without disturbing the crank-shaft. while the further advantage is obtained that either of the cam-shafts can be lifted out sideways at any time without much trouble.

This large casting, Q, has no projecting feet formed solid with it, but it is machined with a straight face down both sides and on its under surface, so that it is a simple matter to fit the two cast-steel cradles, P^3, in such a way as to support it in the chassis. It is these cradles that rest upon the machined strips, A, to which reference has already been made in this article. The lower halves of each of the five bearings for the crank-shaft are held up in place by bolts which pass down from above, as seen in the drawings, and it will be noticed that they slide up between what may almost be regarded as horn-plates, which are solid with the large aluminium casting, Q. For removing the cam-shafts, P^4, there are large doors, Q^3, bolted in place alongside the casting, Q, these portions not only enabling the cylindrical bearing-brasses to be slipped into place, but also carrying the small rock-levers by which the cams operate the push-rods. Each of the bearing brasses is made in two pieces, and is, in fact, a split sleeve, which can be introduced around the cam-shaft through the openings, and be then slid along into the socket that is machined ready for it in the large casting, Q.

In connection with these rock-levers, special provision is made for "timing" each valve and each igniter independently, even while the engine is running. Thus it will be seen that, for each of the valves, the rock-lever is hinged to a fulcrum-pin, Q^5, which passes through a slotted hole in the casting, Q^3, and that there is an adjustable set-screw, Q^6, by which the fulcrum-pin, Q^5, prior to being locked by its nut, can be depressed to the required extent to give the correct "time" of opening and of closing. A device of this kind is available for each of the inlet-valves and each of the exhaust-valves, while a somewhat similar arrangement — which is also illustrated in Fig. 23—is available for the ignition-tappets. For them, however, it is also necessary to be able to vary the time of ignition simultaneously from one of the small levers above the steering-wheel, and thus it is that the left and right-handed adjustment-screw, R^4, is introduced between the two portions of the pivot-pin. This screw, R^4, enables the time of ignition to be adjusted for its own individual igniter, whereas all four igniters are simultaneously timed by the shaft, R^3, which feeds the pivot-pins inward or outward through a rack-and-pinion mechanism. In Fig. 22 it will be seen that this timing-shaft, R^3, passes along the outside of the engine, carrying an enclosed pinion for each igniter.

Just beneath the cam-shaft, easily detachable inspection-doors, Q^4, are fitted, so as to enable the big-ends of the connecting-rods to be got at from either side, there being a pair of these doors for each cylinder. For making a more thorough inspection, the base chamber, Q^1, together with the oil-sump, Q^2, which is bolted to it, can be removed entirely from beneath, it being only necessary to first detach the sheet metal mudguard that passes across beneath the mechanism. The base-chamber itself is very like that on other engines, except for the provision that is made for bolting the oil-sump, Q^2, beneath its centre. No oil can, however, remain inside it, for the oil is conducted by two diagonally placed pipes, P^6, down into the sump beneath it. These two pipes slope forwardly and rearwardly, respectively, and therefore prevent the oil from returning through them, even if the car is on an extremely steep hill. From the sump, the oil is drawn through the pipe, P^7, by the small pump already referred to, and is then delivered by it to the three inner bearings on the crank-shaft and to the other bearings inside the crank-chamber. It is led into the centre of the crank-pins by the oil scoops, P^5, and thus lubricates the big end bearings from inside. The end bearings and the four cylinders are fed with oil in measured doses from an independent lubricator on the dashboard, this being driven by a chain; it containing positive pumps that force the oil down through each of the six feed-pipes.

In Figs. 22 and 23, the ignition gear is visible, but a better idea can be obtained of the igniters themselves from the photographs which we reproduce in Fig. 24. The low-tension make-and-break contact-spindle, R, passes through the main casting diagonally, and so carries the contact-making arm, that it can make and break circuit with the insulated contact-pillar, R^1. The cam-shaft permits the contact to be made when it raises the tappet-rod, R^2, the contact points being actually brought together by a small spring that surrounds the rocking spindle. R; the quick break action that is necessary for ensuring a good spark is brought about by the coiled spring at the lower end of the tappet-rod. It will be noticed that the high-tension ignition plugs, R^6, screw into place in the same inspection-cover castings, these plugs lying close alongside the contact pillars, R^1.

Both systems of ignition are simultaneously timed from the lever above the steering-wheel, the commutator, R^7, and the timing-shaft, R^3, being rocked about their axis at the same time. As will be seen, the fan behind the radiator, together with the centrifugal governor, are driven by a flat belt from the crank-shaft, and the spur-wheels that operate the two cam-shafts are enclosed in a neat, independent, dust-proof casing. Fig. 22 also indicates the manner in which the starting-handle is fitted beneath the radiator.

Table of Reference Letters for the "Austin" Car Illustrations.

The Main Frame.

A	Plared strips for carrying engine and gear-box.
A^1	Radius rods.
A^2	Swivel joints in A^1.
A^3	Torque rod.
A^4	Pivot pin for torque rod bracket.

The Steering Gear.

B	Pivot pins for steering heads.
B^1	Ball thrust bearing.
B^2	Lever arms.
B^3	Tapered bolts.
B^4	Steering head forgings.
B^5	Transverse connecting rod.
C	Steering pillar.
C^1	Sleeve fixed to C.
C^2	Worm.
C^3	Adjustment sleeve.
C^4	Adjustment ring.
C^5	Toothed sector
C^6	Engine controlling tube.
C^7	Engine controlling rod.
C^8	Split thrust collar.

The Rear Axle.

D	Spring-brackets.
D^1	Oil catching sleeves.
D^2	Dust plates.
D^3	Oil throwing sleeves.
D^4	Chain-wheels.
D^5	Jaw clutch collars.
D^6	Live-axle shafts.
D^7	Collars fixed to D^8.
D^8	Axle tubes.
D^9	Tie rods.
E and E^1	Castings containing differential and bevel gears.
E^2	Threaded joint.
E^3	Bearing casting for E^6.
E^4	End bearing for E^6.
E^5	Adjustment collars for thrust bearings.
E^6	Shaft carrying bevel-pinion.
E^7	Adjustment collar for thrust bearings.
E^8	Locking pin for E^7.
F	Propeller shaft.
F^1	Universal joint pins.
F^2	Outer member of universal joint.

The Brakes.

G	Brake shoes.
G^1	Fulcrum pins for G.
G^2	Actuating cams
G^3	Operating levers.
G^4	Disengaging springs.
G^5	Foot-brake drum.
G^6	Fulcrum pins for brake shoes.
G^7	Disengaging spring.
G^8	Adjustment wing-nut.
G^9	Brake pedal.

The Differential Countershaft.

H and H^1	Castings containing differential and bevel gears.
H^2	Threaded joint.
H^3	Bearing casting for H^6.
H^4	End bearing for H^6.
H^5	Bevel wheel.
H^6	Shaft carrying bevel-pinion.
H^7	Bevel pinion.
H^8	End flange for shell of differential.
H^9	Longitudinal shaft.
J	Live shafts.
J^1	Spur wheels on J.
J^3	Bosses for sprockets.
J^4	Sprocket wheels.
J^5	Oil-retaining washers.

The Change-Speed-Gear.

K	Second motion shaft.
K^1 K^2 K^3 K^4	First, second, third, and fourth speed wheels.
K^5 K^6	Intermediate reverse pinions.
L	First motion shaft.
L^1 L^2 L^3 L^4	First, second, third, and fourth speed wheels.
L^5	Sliding rod for first and second speeds.
L^6	Sliding rod for third and fourth speeds wheels.
L^7	Sliding rod for reverse pinions.
L^8	Casting carrying sliding rods.
L^9	Spring catches for same.
M	Operating shaft.
M^1	Lever arm.
M^2	Locking lever.
M^3	Fulcrum-pin for M^2.

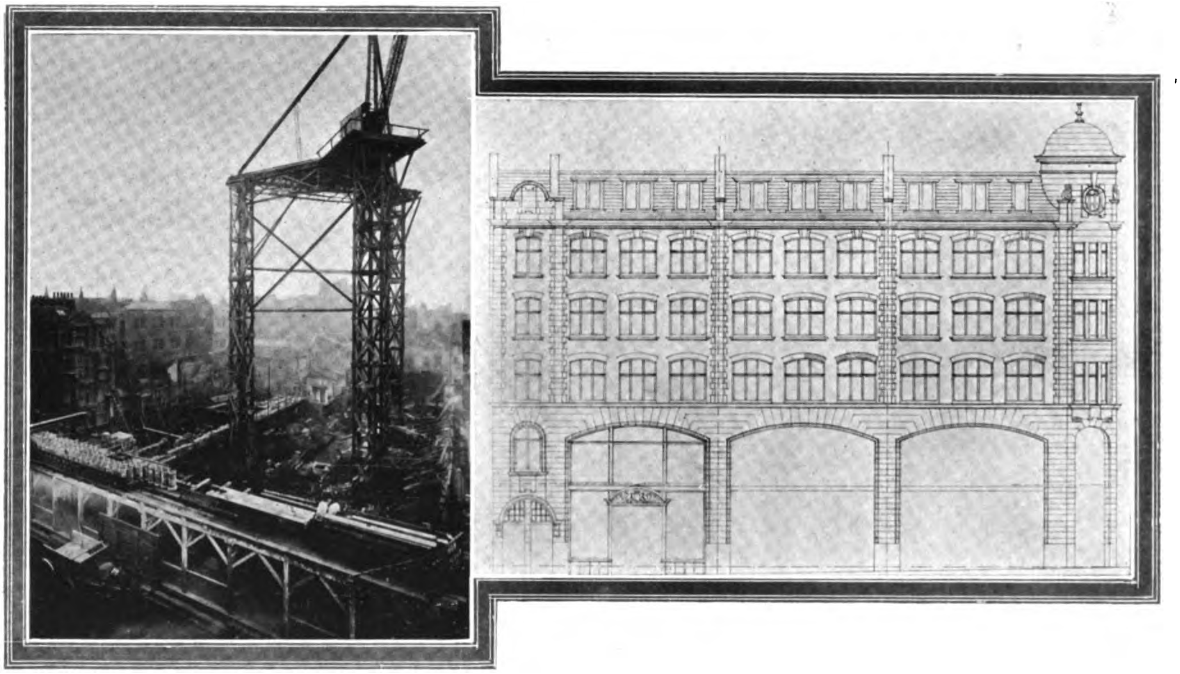
The Main Clutch.

N	Sliding clutch sleeve.
N^1	Disc-carrying spider.
N^2	Disc-engaging flange.
N^3	Clutch spring.
N^4	Thrust collar.
N^5	Rock tube
N^6	Operating lever.
N^7	Clutch pedal.
N^8	Adjustment screw.
N^9	Brake pad.
P	Fly-wheel.
P^1	Dust-proof cover.

The Engine.

P^2	Joint rings for water jacket.
P^3	Steel supporting brackets.
P^4	Cam shafts.
P^5	Oil-catchers for crank-pins.
P^6	Return pipes to oil-sump.
P^7	Feed-pipe to oil-pump.
P^8	Water pump.
Q	Main crank-chamber casting.
Q^1	Base chamber.
Q^2	Oil-sump.
Q^3	Castings carrying cam-gear.
Q^4	Inspection covers.
Q^5	Fulcrum-pins for rock-levers.
Q^6	Adjustment screws for Q^5.
Q^7	Main bearing caps.
R	Igniter rockers.
R^1	Insulated contact pillars.
R^2	Tappet-rods for igniters.
R^3	Timing shaft.
R^4	Individual timing screws.
R^5	Magneto.
R^6	High-tension ignition-plugs.
R^7	Commutator.
S	Centrifugal governor.
S^1	Carburettor.
T	Exhaust-pipe fittings.
T^1	Asbestos packing.
T^2	Stuffing-box gland.
T^3	Baffles.

* * *

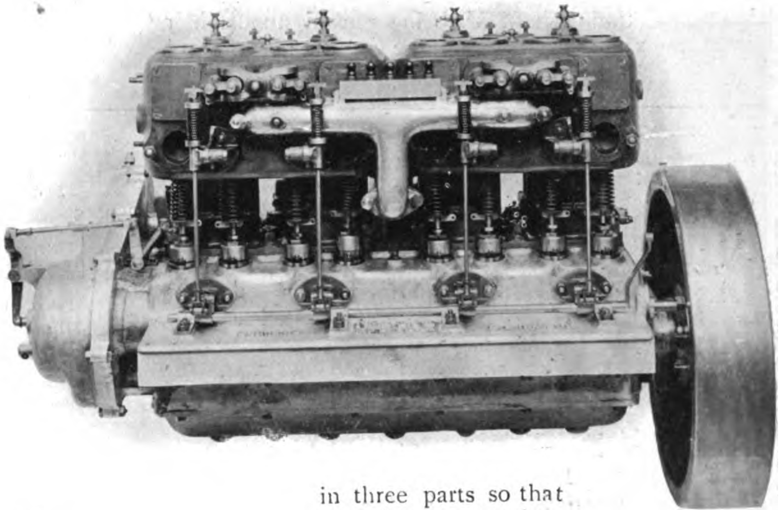


In February, 1905, owing to a disastrous fire in Long Acre the premises then occupied by the Ariel, Swift, and Mercedes-Cannstatt showrooms were entirely gutted. The whole of the space thereby rendered vacant has now been cleared and new buildings of the Du Cros-Mercedes are being rapidly completed, our photographs above showing, on the left, the site in course of being covered, and on the right the elevation of the structure which will ultimately occupy the site of the old premises. This building when completed will probably be one of the largest in London devoted to the motor business. In all, it will have five storeys with total floor space of 53,000 square feet, and from this depot will be handled not only the Du Cros-Mercedes cars, but also the turnout of the Austin and Swift factories.

THE 30–35-H.P. SIMMS PETROL ENGINE.

More especially designed for such heavy commercial vehicles as motor 'buses, this neat though substantially-built engine has its cylinders cast in pairs with water spaces around each cylinder and valve-chamber. It develops about 30 b.h.p. at the comparatively low speed of 800 revs. per min,. and is capable when accelerated of giving about 40 h.p.

Fig. 1 shows it from the left-hand side, where it will be noticed:—that a single enclosed cam-shaft serves to operate the low-tension igniters as well as all the eight valves; that provision is made for varying the time of ignition; that each pair of igniters is held in place by a yoke and a single nut; and that distributing plugs for the connecting wires are fitted above the induction-pipe.



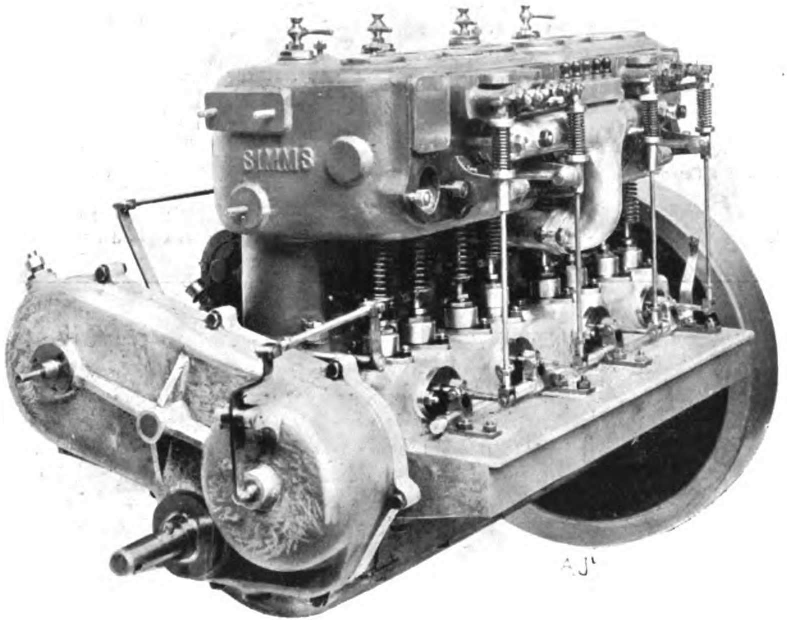
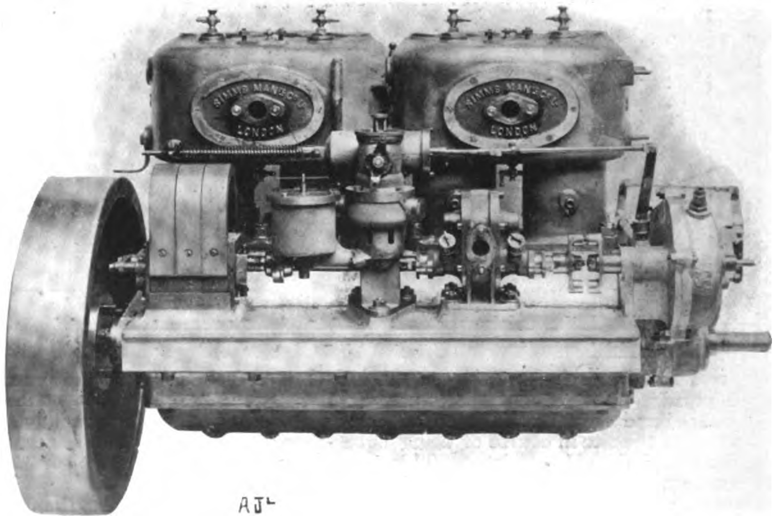


Fig. 2 is a view from the front, looking down the left-hand side, and this not only shows the valve-gear and the ignition-gear but also the oil-tight casing that encloses the spur-wheels and the centrifugal-governor. The large spur-wheel on the cam-shaft carries the governor, and is driven from the crank-shaft by means of an intermediate wheel, which also meshes with another spur-wheel in the opposite end of the casing. Above the cylinders, which have a bore of 120 mm., and a stroke of no less than 135 mm., are the usual compression-cocks and inspection-plugs, while passing across between the two cylinder-castings is the induction-pipe. A special feature has been made of rendering the crank-shaft and the connecting-rods accessible from beneath, the crank-chamber being for this purpose made in three parts so that the lowest portion, which normally serves as an oil-bath for the splash lubrication, can be removed without difficulty.

Fig. 3 gives an excellent idea of the appearance of the engine from the right-hand side, clearly showing the carburettor, arranged centrally, with the governor-controlled throttle-valve above it. The magneto and the circulating-pump are also very prominent; they are so mounted that both are driven by the same enclosed spur-wheel through flexible couplings.

The magneto is of the low-tension type, but provision is made whereby high-tension ignition-plugs can be fitted to the engine, if desired, and a high-tension Simms-Bosch magneto substituted, or an auxiliary ignition system be added. Weighing about 600 lbs. complete, the over-all dimensions are approximately 44¼ ins. long (up to fly-wheel coupling), 24¼ ins. wide (including projecting brackets), and 26¼ ins. high.



A NEW DISTRIBUTOR COIL.

WHEN multi-cylinder cars are fitted with that type of ignition—sometimes called synchronised ignition—in which a single induction coil is used in conjunction with a distributor, instead of employing a separate coil for each cylinder, it is by no means unusual for motorists to have a spare coil fitted which they can bring into operation by means of a switch, and so occasionally give the first coil a rest. This is undoubtedly a very good practice, for it is not desirable that the same coil should be worked unceasingly all day, and it must be remembered that when there is only one coil, its operation, especially with 4 and 6-cylinder engines, is practically continuous, even at moderately high speeds.

With the object of supplying two alternative coils of this kind in a compact and convenient manner, and to overcome the necessity, which otherwise exists, for a more or less complicated system of wiring, the United Motor Industries have introduced an apparatus consisting of two independent induction coils with a special type of switch, contained in a single box. With this arrangement, the external connections are the same as those for the ordinary single coil, everything that is necessary for coupling up either one coil or the other in the circuit being made inside the case, and the operation of changing over being performed by simply moving a switch — which can be done without stopping the engine. The coil is seen complete in Fig. 1.

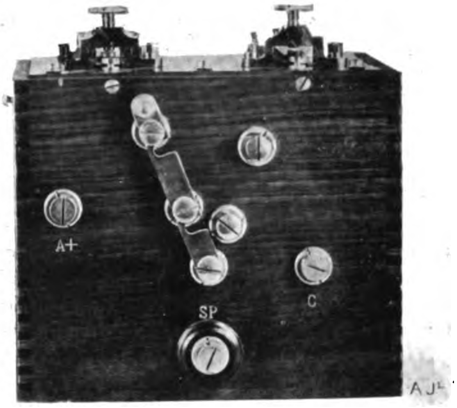


Fig. 1.—View of a new distributor coil introduced by the United Motor Industries. It contains two coils and a switch by which either can be brought into use without stopping the engine.

The diagram which we give in Fig. 2 shows all the connections in the two alternative circuits. From the battery a wire is led to the terminal, marked AC, on the outside of the coil-box, and from this terminal internal connections are made through the two tremblers to the live ends of the primary windings of the two induction-coils. The other ends of the primary windings are connected to two of the switch-contacts respectively, as shown in the diagram. The switch-bar itself is pivoted and is connected to C, and from this point a wire is led externally to the commutator, which is mounted on the engine in the usual way; the low-tension circuit is, therefore, incomplete until the switch-bar is thrown across into contact on either one side or the other. Two other switch-contacts are, it will be noticed, provided on the face of the coil-box, and these are connected to the ends of the high-tension windings respectively; the live ends of both high-tension coils are brought to the common terminal, marked SP. From this terminal, SP, a wire is taken externally to the distributor in the usual way.

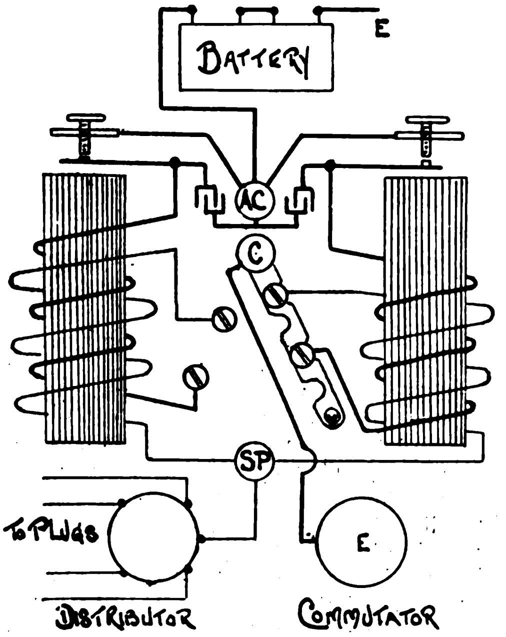


Fig. 2.—Diagram showing the connections of the new United Motor Industries' distributor coil. With the exception of the wires to the battery, commutator, and distributor respectively, all the other connections are made permanently inside the coil-box.

In most coils it is usual for the end of the high-tension winding to be connected internally to one end of the primary winding in order to reduce the external wiring to a minimum; in this case, however, the two windings are separate until connected by the switch, because to join them permanently in the usual manner would "short circuit" the ignition-plug.

⊗ ⊗ ⊗ ⊗

More Motor Car Law.

THE automobile movement continues to be fertile in the production of books on the interpretation of the decidedly confused statutes and rules which determine the position of the car owner in the community. In many respects two of the best volumes on this subject which we have seen are "The Law of Motor Cars and Motor Cycles," and "The Law of Heavy Motor Cars," both by Mr. D. H. Pettitt, and published by Jordan and Sons, Ltd., at the sum of 3*s.* 6*d.* each. The general arrangement of the two works is similar, that is to say, there are a number of chapters forming the body of each which give a general view of what the owner and user of each type of vehicles is legally compelled to do, and to abstain from, supported by the consideration of such cases as have already been determined. These are then followed by extensive appendices, which give the Motor Car Acts and the regulations and orders made by the Local Government Board under them. This principle of arrangement undoubtedly has its advantages.

THE GORDON-BENNETT CUP RACE.

WHAT WILL IT BECOME?

Will it Rise from its Ashes?

IRISHMEN are popularly supposed to love rows, but there is no doubt at all about it that the Englishman loves a race, and there are many people both in automobile circles and outside them who, we feel sure, will be delighted to learn that there is a possibility of the Gordon-Bennett Race, the blue ribbon of what was once, with some confusion of metaphor, called the automobile turf, may be resuscitated—if on a somewhat more rational basis. The A.C.G.B.I. has, at any rate, taken preliminary steps with that object in view. Some months ago the General Committee of the club adopted resolutions in favour of so doing, and the Competitions Committee has recently approached the A.C. de France. The French Club have accordingly arranged that a meeting of representatives of the different national automobile clubs shall be held at Pont de Gennes on June 25th, the day before the Grand Prix Race takes place, for the purpose of discussing whether the Gordon-Bennett Race shall be resuscitated, and of deciding, if an affirmative conclusion be come to, what alterations shall be made in the rules.

How the Race might be Remodelled.

The Gordon-Bennett Race has been so well established in the public mind and in popular favour, that its resuscitation would be widely welcomed. But we are certainly of opinion that hand in hand with resuscitation should go reform. In fact, one of the principal—even if generally obvious—reasons why the race was dropped out of the list of current events was most undoubtedly that it ceased to be of real use. The simple restrictions which the rules imposed worked well enough in the early days of racing, and the experience then gained was of real value to engineers and designers of touring cars, for the racing car of one year was, to all intents and purposes, the touring vehicle of the next. This state of affairs prevailed till fairly recently, but now the racing car is entirely a thing *sui generis*, and the racing car of to-day is no longer destined to be equipped with a comfortable body and become the family coach of to-morrow. But a high degree of public interest had for long concentrated itself round the Gordon-Bennett Race. In fact, it had almost become a sentiment, and the proposal of the Club has accordingly evoked a wide amount of popular response, and a widespread desire to see the race once more established as the most attractive event of the automobile year.

While Changing, Preserve!

At the same time, no-one wants to see the leading features and main characteristics of the Gordon-Bennett entirely changed, and chief amongst these were that it was essentially a race for powerful cars, though it was never intended to become a mere race for monstrosities. To do something that should encourage the development of the practically useful car was Mr. James Gordon-Bennett's intention when he dedicated the Cup. Such has been the growth of automobile construction, and the development of automobile speed capacity, that, to make the race do now what it was originally intended to do, much the same type of restriction is needed as is imposed in the case of our own Tourist Trophy Race—modified as regards useful load and fuel allowance—so as to enable the more powerful types of touring car to compete.

To be a Real Test for Large Touring Cars.

At the present time a large number of 40, 50 and 60-h.p. cars are being sold to the public, and with this type of car an excellent long distance speed contest could be organised on a suitable course, on the basis we have just indicated. We have frequently urged the advisability of organising additional races of the Tourist Trophy type, both for larger and for smaller cars than those for which the rules of the existing Tourist Trophy race have been framed. These rules practically exclude anything that differs very much, either upwards or downwards, from a 20-h.p. light fast 4-seated touring carriage. This, at any rate, is the sort of very important vehicle that the present Tourist Trophy rules—with their 25 mile per gallon fuel allowance, and their 1,125 lb. useful load restriction—tend to develop. If the Gordon-Bennett Race could be so resuscitated as to perform a similar service, and constitute an interesting and exciting contest for heavier and even faster touring carriages of the more luxurious kind, with a fuel allowance of say 15 miles per gallon, and a useful load of, say, 2,000 lbs., the rejuvenated Gordon-Bennett Race would undoubtedly prove of real utility to the automobile movement, as well as being interesting and instructive to the public. It would, moreover, continue to be quite as attractive and exciting as ever it was.

Misunderstanding Still Prevalent.

Unfortunately, suggestions of this description, and, in fact, any suggestions based on what we may call Tourist Trophy principles, are still liable to be utterly misunderstood, and the true significance of the fuel limitation totally misapprehended by the public, and even by bodies that ought to know much better. An example in point is provided by the recent 2-gallon Efficiency Trial organised by the A.C. of America, in which the prize went to the vehicle which could carry the heaviest load the furthest distance on two gallons of petrol. No account whatever was taken of the speed attained, and the absurdity of the whole competition is strikingly shown by the fact that a motor char-a-banc *and* a tricar were permitted to compete against one another. Until people realise that it is futile to attempt to organise any automobile event in which cars of a totally different character are allowed to compete with one another, it is hopeless to expect them to fully grasp the principles on which contests of real utility for the further development of the industry can be based. When this point receives general recognition, it may then be possible for them to also realise that a fuel limit is a very convenient method of ensuring a common basis of horse-power, and that that limitation, taken in conjunction with a restriction as to the useful weight carried by the chassis, is the surest known means of enabling the best car of a particular type either to win a pure and simple race, or to travel the greatest distance at some specified minimum speed.

RACES, RECORDS, AND TRIALS.

FROMES HILL CLIMB.

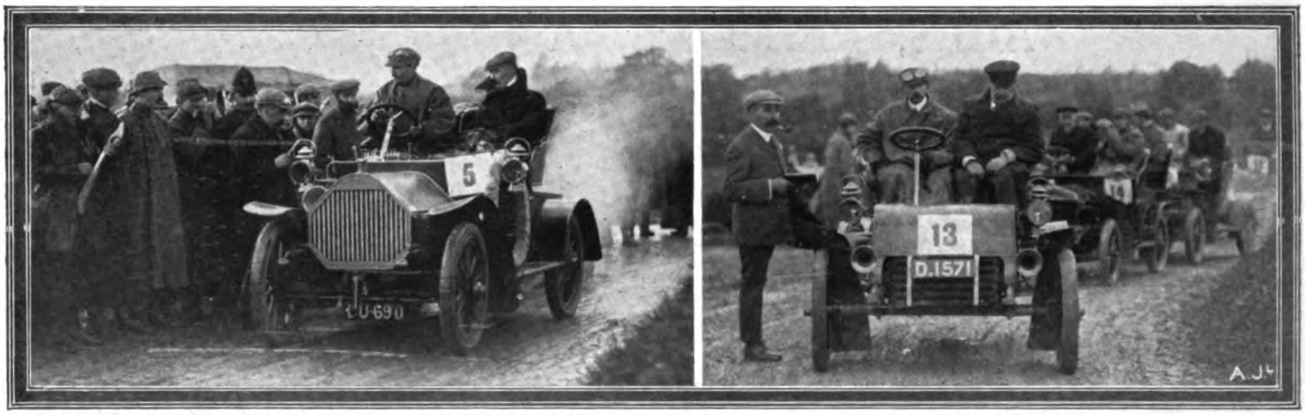
If any of the inhabitants of Hereford imagined their old world city to have been forgotten by those motorists who spent such a pleasant time there during the Small Car Reliability Trials nearly two years ago, they must have realised that they were very much mistaken on the occasion of the Hill Climb Competition which the Hereford Automobile Club organised for Thursday of last week. It would be improper to enquire how many entries the energetic secretary, Mr. Wilfred Groom, really expected to receive as the result of the preliminary announcements, but it was very certain that he was genuinely surprised to find the number mount up to 67, and still more so, when no less than 61 of these put in an appearance on the day of the contest. Fromes Hill has a reputation which extends a long way outside Herefordshire, and there can be little question that its well-remembered connection with the A.C.G.B.I. famous Small Car Trials had much to do with the monster gathering on Thursday, at any rate, it is hardly possible that many of those who were present could have run over in the fond imagination that they would have, as is sometimes the case at provincial meetings, the event all to themselves. Not only was the meeting successful in point of numbers, but it was representative in character as well, and altogether will probably constitute one of the best attended provincial meetings of the season.

Fromes Hill Climb.—Marshal J. W. Orde.

Among those who took part in the climb was Mr. Cecil Edge on his 6-cylinder 40-h.p. Napier. Mr. Tom Thornycroft took down one of his 24-h.p. cars, and Mr. Gordon Usmar was also there with a 14-h.p. Vinot—not to mention Mr. T. H. Woollen, who made his *début* on a 20-h.p. Clement-Talbot car, which must have been quite an experience for one whose association with speed trials has always been of such a very different character. Events of this nature have often been the occasion of a first public trial of new cars, and at this meeting the 30-h.p. Westinghouse—which has only just come to this country, although already a year old in Paris—and the 15-h.p. De la Buire, were among the dark horses which added to the general interest in the competition. Mr. Harvey Du Cros, Jun., brought down one of the new Austin cars; but this was not entered

FROMES HILL CLIMB.—The organising Hon. Secretary of the Meeting, Mr. Wilfrid Groom, at work in his "office" at the foot of the hill.

FROMES HILL CLIMB.—Cars waiting for the start.



FROMES HILL CLIMB.—The 10-12-h.p. Humber (on the left) waiting to start, and Mr. J. C. Madeley's 8-10-h.p. Cadillac in place for the next call.

FROMES HILL RESULTS.

Open Competition.

Place.	Official No.	Car and Entrant.	Marks.
		h.p.	
(GM) 1st	23	12-16 Clement-Talbot (C. R. Garrard)	
	16	10 Alldays (Alldays and Onions)	0·857
(SM) 2nd	19	10 Alldays (S. Downing)	0·864
(BM) 3rd	46	10-14 Clement-Talbot (Lord Shrewsbury)	0·887
4th	7	10-12 Clement-Talbot (J. Wyndham-Smith	0·903
5th	4	8 Rover (R. L. Jefferson)	0·915
6th	61	30-35 Metallurgique (Metallurgique Co.)	0·931
7th	56	30-40 Daimler (F. W. G. Greswolde-Williams)	0·944
8th	6	8 Darracq (H. P. Barker)	0·946
9th	18	12 De Dion (Newey's Garage)	0·957
10th	31	16-20 Humber (E. C. Pullinger)	0·983
11th	3	6 Wolseley (Wolseley Co.)	0·993
12th	8	10 Darracq (Newport Garage)	0·994
13th	58	40 Napier (Cecil Edge)	0·995
14th	32	16-20 Sunbeam (E. Eastmead)	1·002
15th	14	10 Alldays (W. Allday)	1·002
16th	57	30 Peugeot (C. Friswell)	1·014
17th	53	28 Pipe (R. McCaskill)	1·032
18th	43	22 Minerva (D. Citroen)	1·044
19th	20	15 De La Buire (Hollingdrake Auto Co.)	1·062
20th	9	9-10 Swift (R. Burns)	1·069
21st	27	16 Rover (Philip Graham)	1·075
22nd	45	16-20 Leader (Cars, Ltd.)	1·078
23rd	54	28-36 Daimler (Capt. D. Hughes Morgan)	1·082
24th	35	14 Germain (Capt. Theo Masui)	1·087
25th	24	12-15 New Arrol-Johnston (W. P. Thomas)	1·088
26th	55	40 Crossley (C. Jarrott)	1·095
27th	42	25-30 Iris (Legros and Knowles, Ltd.)	1·101
28th	37	20-24 Clement-Talbot (T. H. Woollen)	1·104
	5	10-12 Humber (Humber, Ltd.)	1·104
29th	39	14 Vulcan (A. W. Marriott)	1·108
30th	66	30 Westinghouse (C. Friswell)	1·151
31st	51	25-30 Hardman (W. L. Hardman)	1·153
32nd	65	18 Arrol-Johnston (J. S. Napier)	1·154
33rd	36	16-20 Rover (J. K. Starley)	1·155
34th	34	18-22 Rochet-Schneider (J. C. Madeley)	1·178
35th	33	16-20 Sunbeam (E. Eastmead)	1·187
	30	14 Germain (Capt. Theo Masui)	1·187
36th	38	20 Rolls-Royce (Hon. C. S. Rolls)	1·188
37th	26	15 Darracq (Morgan and Co.)	1·194
38th	21	12-15 Arrol-Johnston (Jno. Wilson)	1·202
39th	40	20 Pilain (E. D. Heinemann)	1·203
40th	25	14 Vinot (N. Littlejohn)	1·211
41st	29	10-12 Metallurgique	1·227
42nd	60	24 Thornycroft (T. Thornycroft)	1·244
43rd	17	10 Star (Newey's Garage)	1·306
44th	13	8 Maxwell (F. W. Peckham)	1·332
45th	10	10-12 Humber (Gibbon Brooks)	1·372
46th	50	26-30 Simms-Welbeck (Simms. Mfg. Co.)	1·396
47th	22	12 Vauxhall (P. C. Kidner)	1·449
48th	48	26-30 Simms-Welbeck (Simms Mfg. Co.)	1·606
49th	62	30-40 Martini (Douglas Graham)	1·692
50th	41	25 Winton (Mapplebeck, Stuart, and Co.)	1·790

Club Competition.

1	1	6 Wolseley (Wilfrid Groom)	·963
2	7	30-40 Daimler (Greswolde-Williams)	·969
3	2	10 Vulcan (W. Bradford)	1·041
4	5	15 Darracq (H. F. S. Morgan)	1·194
5	6	20 Darracq (S. W. Leach)	1·335

(GM) Gold Medal, (SM) Silver Medal, (BM) Bronze Medal.

Order based on speed only (Official Nos.): 56, 57, 55, 58, 61, 23, 27, 66, 42, 31, 38, 20, 5, 50, 53, 40, 16, 54, 36, 60, 35, 46, 43, 37, 34, 51, 17, 48, 25, 30, 65, 45, 32, 41, 26, 33, 7, 10, 19, 39, 9, 4, 3, 8, 12, 14, 18, 24, 22, 29, 21, 6.

In the motor cycle event the Quadrant was the only successful machine.

FROMES HILL CLIMB.—The two Simms-Welbeck Cars at the starting line. At the wheel of the first is Mr. T. H. Woods, and at the second Mr. D. McNeill. Note the Simms safety buffers on both cars.

Fromes Hill Climb.—Mr. Q. Miller, one of the Clerks of the Course.

Fromes Hill Climb.—Mr. A. V. Ebblewhite, who timed the cars at the starting point.

in the trials, although it was made to show its paces unofficially.

There were two classes for the cars, one of which was open, and the other restricted to members of the club. Two ascents were permitted and the result was determined by a handicap based on the following formula :—

$$\frac{\text{Time in Seconds} \times \text{Horse Power.}}{\text{Weight in lbs.}}$$

Lowest deduction to be the winner and h.p. to be calculated as follows:—H.P. = Diam.^{2} × No. of Cyls. ÷ 3.

The distance covered was 1,289 yards, and this included a total rise of 344·61 ft., the average being 1 in 11·22, and the steepest part 1 in 6·37. Each car had to be fitted with its regulation touring body and to carry its full complement of passengers. Although no times are published, in accordance with A.C.G.B.I. regulations, it may be concluded that cars like the Daimlers, Crossleys, and the Napier, to mention only three of the many famous makes which took part, were not much under the legal limit, but after the formula had been applied like a magic wand, it was found that Mr. Huband's 10-h.p. Alldays had gained the gold medal, and that a similar car owned by Mr. Spencer Downing had secured the next prize, a silver medal. Lord Shrewsbury's entry of a 10–14-h.p. Clement-Talbot was successful in securing the bronze medal awarded as third prize. Since issuing their official results, it transpired that the officials had evidently discovered a mistake, for we have since then received a communication from the Clement-Talbot Company, stating that they have received the following telegram from the hon. sec. of the Herefordshire A.C. :—"Car 23 ties for Gold Medal. Timekeeper's mistake. Congratulations." Our table is corrected accordingly.

FROMES HILL CLIMB.—The inspector of police who arranged the policing of the hill during the contest, and his "1-h.p."

Frome Hill Climb.—Mr. T. D. Dutton, the official time-keeper who recorded at the top of the hill.

In the club events, Mr. Wilfred Groom, the popular hon. secretary, carried off the prize with his 6-h.p. Wolseley, Mr. Greswolde-Williams' 30-h.p. Daimler being second.

The table gives the official results in their order of merit as determined by the formula. Fastest times were made by, 1st, Mr. Greswolde-Williams' 30–40-h.p. Daimler; 2nd, Mr. C. Friswell's 30–40-h.p. Peugeot; 3rd, Mr. Chas. Jarrott's 40-h.p. Crossley; 4th, Mr. Cecil Edge's 40-h.p. Napier. Four cars failed on the hill, these being the 6-h.p. Rover, 8–10-h.p. Cadillac, 10–12-h.p. Clement, and 18–24-h.p. Vulpes. We cannot help thinking that such ill-success must have been very largely attributable to bad driving, for although the hill is steep it should have been within the capabilities of all these cars, and we have ourselves seen the Cadillac mount it easily, even with a damaged gear.

Durham Hill Climb.

On Saturday, June 16th, the North-Eastern Automobile Association are holding a hill-climbing competition at Ragpath Side, about 3 miles from Lanchester Station, on the road from Broadwood to Durham, the starting point being near the by-road to Hollybush. The hill rises 233 feet in the total distance of 880 yards, giving an average gradient of 1 in 11·3 and a maximum of 1 in 5·3 for about 40 yards near the top of the hill. A stretch of 170 yards of practically level road at the bottom of the hill gives competitors a chance to attain a fair speed before tackling the real ascent. There are eleven classes, commencing with Class I., for motor bicycles not exceeding ½-litre cylinder capacity, and ranging up to motor cars having a cylinder capacity up to and over 6 litres. The competition commences at 1 p.m., and all machines must be owned or driven by members of the Association. Steam cars are eligible to compete in the same classes with petrol vehicles, each double-acting cylinder being reckoned equal to four cylinders of an internal combustion engine.

"Henry Edmunds" Hill Climb.

The contest for this Cup, to be held on July 14th, will, by permission of Mr. F. S. Philipson Stow, take place at Blackdown Park, Fernhurst, the scene of the recent very successful meeting of the Auto Cycle Club.

Fromes Hill Climb.—Mr. A. Townsend, who started the cars.

FROMES HILL CLIMB.—Cecil Edge on the 40-h.p. 6-cylinder Napier. The last few seconds being counted off before starting.

NILGIRI MOTOR TRIALS.

THERE has recently been held in India some reliability trials which are of a particularly interesting nature on account of the definiteness of the object for which they have been held. They have been carried out under the auspices of the Southern India Motor Union, and have been made solely with a view to finding the most suitable car for planters and other residents within the limits of the Nilgiri and Wynaad districts.

Owing to the very extreme character of the roads, the trial was practically limited to small cars, for any vehicle having a long wheel base would have been incapable of successfully negotiating all of the twenty "hairpin" corners which broke the monotony of the 67 miles course. The would-be motorists, for whose benefit the trials were conducted, had a very clear and definite opinion of what they wanted to be most clearly brought out, and the rules were consequently largely based on the recommendations which they made to the Organising Committee. It was decided, for instance, that they did not want the cars to make more than an average speed of from 8 to 12 miles an hour, and they were also very definite on the point that the capability for rounding each and every of the said twenty "hairpins" without reversing should be a *sine qua non*. Cost was also an important consideration, and a system of marking was consequently adopted in which this, as well as the other matters, formed an item. Briefly enumerated, the following were the main heads under which marks were allotted :—

1. For cost, maximum 20; a car costing Rs. 2,000 would get 20 marks. A deduction of 1 mark for each Rs. 200 by which the listed price in India exceeded Rs. 2,000 was made. If the car was not listed by any agent in India 50 per cent. was added to the English price.
2. For speed, maximum 40; one mark for each $\frac{1}{10}$th mile per hour average above 8 m.p.h.
3. For ease of turning, maximum 40; at each of four specified corners a car got 10 marks for turning clean and lost 10 if requiring to back more than once or to be man-handled.
4. For brake control, maximum 20; tested by power of stopping on meeting obstacles round blind corners.
5. For extra passengers, 4 per passenger.
6. For extra seating accommodation, 2 per seat.

A start was made from Charing Cross, Ootacamund, which is 7,112 ft. above sea level, and the route followed was through Peat Bog Tollbar, Tiger's Hill, Runnymede Corner, Kolakumbai Bridge and Lovedale Crest, back to Ootacamund. Practically all parts of the route were typical of the average Nilgiri roads, and although, with few exceptions, the surface was good, yet the course offered several very severe hill-climbing tests, as well as being of an exceptionally winding character. Every

FROMES HILL CLIMB.—Mr. E. E. Leverett on the 24-30-h.p. Standard in place for his turn.

Oscar Cüpper makes a good start on the 30–35-h.p. Metallurgique.

W. H. Mapplebeck travelling well, halfway up, on the 25-h.p. Winton.

FROMES HILL CLIMB.

care was taken in the organisation of the Trials to ensure success, and the competitors were guided along the route by the frequent use of large screens bearing the word "Trials," and having a hand painted on them pointing in the direction that the cars were to go. There were only eight starters, and these included two Wolseleys, two Speedwells, a De Dion, a Swift, a Rover, and a Turner-Miesse steam car, and it will be seen from our table, which embodies the results, that the 7-h.p. Swift car came out ahead of the others. There was a comparative absence of the exciting incidents which usually characterise trials of this nature, but some of the features introduced by the organisers added considerably to the interest in the run. One of the most original was the brake test. A screen with the word "Stop" on it was placed right across the road on a slope near Karkeri round a blind corner. Cars had to pull up on seeing this, and obtained 1 mark for each yard short of the screen at which they came to rest. Ten marks was decided as a maximum, but the screen was first visible when the cars were still 30 yards from it. Only one car, the 7-h.p. Swift, obtained full marks, and only one car, the 10-h.p. Turner-Miesse, failed to pull up in time, this latter vehicle having enlivened the situation by running straight through the screen and pulling up at a distance for which it was credited with *minus* 10. There was a second part to this brake test, in which another screen with a 7 ft. gap in it was similarly placed across the road round a blind corner near Springfield. The cars had to pass through without touching, and the idea of the gap was that it approximately represented the sudden approach to a bridge, such as might be expected in districts where a car would have to be sufficiently under control, either to be guided safely on to its somewhat narrow passage, or else pulled up short. All cars obtained full marks in this test, however, and it was generally considered that the gap was too wide to be a really severe trial. It was a very sensible test all the same, as the width was chosen because it represents that of several bridges in the district.

The 7-h.p. Swift and the 9-h.p. Speedwell alone qualified for non-stop awards. The 10-h.p. Turner-Miesse steam car used paraffin as fuel, and obtained 9 marks for so doing, the maximum marks under this heading being 10, provided that not more than half a gallon of petrol was carried for starting purposes. If more than half a gallon was carried 9 marks were allotted, a further deduction of three marks being made for each

The finishing point, looking up the course. The 12–15-h.p. New Arrol-Johnston Car, driven by W. P. Thomas, passing the finishing tape.

The finishing point, seen looking down the hill. The 12–15-h.p. New Arrol-Johnston driven by Jno. Wilson completes a splendid run.

FROMES HILL CLIMB.

FROMES HILL CLIMB.—Outside the Mitre Hotel, Hereford. The car on the left is the "Iris."

⅛th of a gallon in excess. Several drivers remarked after the Trials that a very distinct difference in the power of their engines was noticeable at the different altitudes reached. The lowest point on the course, Kolakumbai Bridge, being 4,940 feet above sea level, while the highest point just outside Ootacamund having an altitude of 8,140 feet.

Table of Results.

Place.	Car.	Marks.					
		Speed.	Cost.	Handiness.	Brake Test.		Total.
					Closed screen.	Open screen.	
	h.p.						
1	7 Swift ...	40	11	40	10	10	111
2	5 Wolseley ..	31	16	30	9	10	96
3	6 Rover ...	29	18	30	5	10	92
4	6 Wolseley ...	37	12	20	4	10	83
5	6 Speedwell...	21	18	30	1	10	82*
6	6 De Dion ...	15	9	30	1	10	67*
7	9 Speedwell	21	10	10	7	10	62†
8	10 Turner-Miessé	40	9	10	- 10	10	59†

* Extra seats = 2 marks. † Extra seats = 4 marks.

The Race for the Milan Gold Cup.

WE are now able to complete the account which was published in THE AUTOMOTOR JOURNAL last week, of this very important racing event, of which there were two days to run off at the time of our going to press.

At the finish of these last two stages of the race, to Brescia on May 23rd (405·6 kiloms.), and home again to Milan on the 24th (158·2 kiloms.), of the 48 cars which started on May 14th from Milan, 16 only remained in the running, the penalisations of these 16 ranging from 0 to over 9 hours. The enactment of the final scene took place at 4·57 p.m. at Milan, when Macdonald arrived on his splendid 6-cylinder Napier, and as on each occasion throughout the previous ten days' strenuous work, to the second up to his official time and to the strains of "God Save the King." He was quickly followed by Cagno, Lancia, and the others, the Italians being greeted with their National Anthem; Nagliati, the plucky driver who had steered the De Dion car through the trial, passing in front of the Royal Stand whilst the band played the "Marseillaise." To receive the hardy but worn-out competitors, Princess Letitia Buonaparte, the Royal patroness of the event, had driven up to the Exhibition grounds in her De Dion car in good time to see Macdonald arrive, to whom she promptly presented a medal in honour of the occasion. The 16 cars, with their drivers, who actually finished the 2,760 miles, and the unofficial penalisations, were as follows:—

1. Lancia (Fiat), 0s.
2. Maggioni (Zust), 7s.
3. Cagno (Itala), 10s.
4. Nazzaro (Fiat), 35s.
5. Boschis (Fiat), 1m. 27s.
6. Macdonald (Napier), 2m. 22s.
7. Glentworth (Napier), 6m. 51s.
8. Fraschini (Isotta-Fraschini), 12m. 12s.
9. Pfanz (Benz), 40m. 51s.
10. Bossano (Benz), 1h. 19m. 11s.
11. Vercelone (Diatto-Clement), 1h. 23m. 35s.
12. Minora (Isotta - Fraschini), 1h. 28m. 44s.
13. Arbitrio (Diatto - Clement), 1h. 43m. 30s.
14. Fabry (Itala), 3h. 18m. 44s.
15. Von Lude (Martini), 5h. 48m. 26s.
16. Nagliati (De Dion-Bouton), 9h. 32m. 53s.

Cologne A.C. Tourist Car Contest.

RESULTS of the Cologne Trial are published as follows:—

Cat. 1. *Under* 14-*h.p. cars.*—1. 10-h.p. Peugeot; 2. 14-h.p. Benz; 3. 8 to 10-h.p. Maurer-Union.

Cat. 2. 14 *to* 20-*h.p.*—1. 20-h.p. N.A.G.; 2. 18-h.p. Clement-Bayard; 3. 16-h.p. Adler; 4. 16-h.p. Benz.

Cat. 3. 20 *to* 32-*h.p.*—1. 28-h.p. Adler; 2. 28-h.p. Benz; 3. 25-h.p. Opel-Darracq.

Cat. 4. 32 *to* 45-*h.p.*—1. 45-h.p. Metallurgique.

Cat. 5. *Over* 45-*h.p*—1. 46-h.p. Argus.

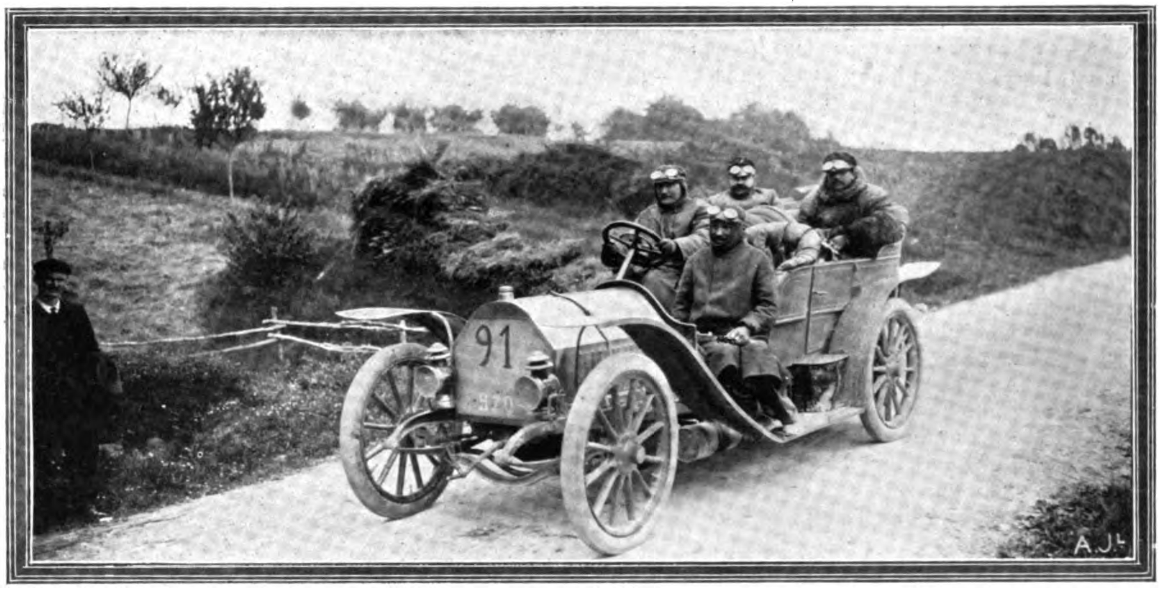
The best three in their order of merit were the 20-h.p. N.A.G., 28-h.p. Adler, and 18-h.p. Clement-Bayard. The distance was 480 kiloms., spread over two days. Weather and roads throughout were very bad.

FROMES HILL CLIMB.—"Weighing in" after the competition at Hereford. No. 10 is Mr. Gibbon Brooks' 10-12-h.p. Humber, and 48 is Mr. G. H. Woods' 26-30-h.p. Simms-Welbeck Car.

The eleven daily journeys accomplished were:—

		Mls.
May 14.	Milan to Bologna	250
May 15.	Bologna to Rome	282
May 16.	Rome to Naples ...	150
May 17.	Naples to Rome ...	250
May 18.	Rome to Florence	234
May 19.	Florence to Genoa	271
May 20.	Genoa to Turin ...	280
May 21.	Turin to Milan ...	250
May 22.	Milan to Udine ...	291
May 23.	Udine to Brescia	252
May 24.	Brescia to Milan	250
		2,760

The original 48 sent off from Milan comprised 24 Italian cars, 8 Franco-Italian, 5 French, 5 German, 3 Swiss, and 3 English cars. Of the finishing cars, it will be seen that the following finished: 8 Italian, 2 English, 2 German, 2 Franco-Italian, 1 French, 1 Swiss, which shows a very fine proportion for British-built cars, especially when it is borne in mind that the two British cars which finished were identically of the same make, viz., the two Napiers. That Macdonald, who led off the race on the first day, was able without the smallest hitch to maintain his premier position from first to last in reaching the end of each day's run, is a remarkable performance, particularly in view of the fact that he neither spoke Italian nor was he in any way familiar with the route of the trial, so that he was compelled to practically find his way and at the same time to maintain the remarkable average speed of 40 kiloms. per hour throughout, during what was probably the most trying series of daily runs that have ever been embodied in one single trial. Once only was he penalised, to the extent of about 2½ mins., this deduction being under the rule which restricted the time of arrival by fixing a maximum speed at which only each car was permitted to cover each day's journey. Inasmuch as Macdonald was at every finishing point never less than about one hour in advance of this minimum time, the problem of arriving to the exact second simply depended on the synchronising of the timekeepers' watches from point to point. Upon the occasion of his being penalised for the 2 mins. odd, he might just as well have passed the control 2½ mins. before his time as 2½ mins. after it, as he was simply waiting "on the clock" to cover the last few yards to reach the control. It is, of course, impossible to say who was right under the circumstances, but it does appear an absolute absurdity that an important trial of this character should be either lost or won by such an utterly ridiculous system of marking. Without in the smallest degree wishing to detract from the magnificent performance of Lancia and the drivers of the other Italian cars, particularly the Fiats, we feel that one and all will agree that whatever honours have accrued to Lancia as the only driver without a penalisation under the awards by the Organising Committee, will be equally shared morally by Macdonald and his British-built Napier vehicle. The official results are:—



The Berliet Tourist Car which has secured the Touraine Cup in the 4-Days' Trial recently held.

The Fiat firm takes the "Team" Cup, and Lancia (Fiat) the Gold Cup. In addition to this, Lancia also secures the special prizes for the first car which reached the following towns respectively viz., Florence, Turin and Udine. Although Macdonald actually reached these towns first, as he did every other main town *en route*, it is contended that owing to the original penalisation at the commencement of the race, he is not entitled to claim that his was the first arrival in such towns. The second prize goes to E. Maggiori (Züst); the 3rd, A. Cagno (Itala); 4th, Nazzaro (Fiat); 5th, Boschis (Fiat); 6th, A. E. Macdonald (Napier); 7th, C. A. Glentworth (Napier); 8th, V. Fraschini (Isotta-Fraschini). A number of minor prizes are also distributed.

Circuit Européen.

It looks as if the fate of this European event, at any rate for 1906, is sealed, as following the request of the German Club, and, apparently, the acquiescence of the French Club to a postponement, the Italian A.C. are now reported as being favourable to a postponement.

Touraine A.C. Tourist Trial.

This trial, which concluded on Monday, was spread over four days, and consisted of a hill climb over 300 metres, an endurance test over a distance varying from 300 to 450 kiloms. (according to class), a speed run over the flying kilom., and brake tests. Points were apportioned as follows: Regularity 600, hill 200, price 100, speed kiloms. 200, and brakes 100. The chief honours have fallen to a 40-h.p. Berliet car.

The tentative results, subject to a protest by the entrants of the 35-h.p. Aries car, are given in our table. The distances travelled for regularity was 375 kiloms. for classes 3 and 4, and 450 kiloms. for classes 5 and 6.

Place.	Car.	Hill Time.	Regularity.		Flying Kilom.
	CAT. 3.—5,001 *to* 10,000 *francs chassis* (375 *kiloms.*).				
		secs.	h.	m.	secs.
1	20-h.p. Murbais-Lasnier	$56\frac{4}{5}$	7	21	62
2	12-h.p. Brouhot... ..	$49\frac{2}{5}$	7	8	69
3	12-h.p. Delaugere ...	$61\frac{4}{5}$	7	36	80
4	16-h.p. Boyer	$78\frac{1}{5}$	8	8	77
	CAT. 4.—10,001 *to* 15,000 *francs chassis* (375 *kiloms.*).				
1	18-h.p. Mieusset ...	$34\frac{2}{5}$	6	20	54
2	16-h.p. Herald	$39\frac{3}{5}$	8	5	64
3	20-h.p. Vinot	$40\frac{4}{5}$	7	34	59
4	16-h.p. Herald	$41\frac{4}{5}$	6	37	60
5	24-h.p. Brouhot... ...	$39\frac{2}{5}$	6	14	61
6	16-h.p. Herald	$44\frac{1}{5}$	7	1	64
7	24-h.p. Brouhot	51	6	38	58
8	16-h.p. Dixi	$63\frac{3}{5}$	7	38	—
	CAT. 5.—15,001 *to* 20,000 *francs chassis* (450 *kiloms.*).				
1	40-h.p. Berliet	$26\frac{4}{5}$	6	7	46
2	35-h.p. Aries	$38\frac{4}{5}$	7	36	60
3	25-h.p. Delahaye ...	57	9	49	60
4	30-h.p. Delaugere ...	$41\frac{4}{5}$	6	37	63
	CAT. 6.—*Over* 20,000 *francs chassis* (450 *kiloms.*).				
1	45-h.p. Delahaye ..	$42\frac{4}{5}$	6	52	—

Tour de France Contest.

EXTENDING over thirteen days, this contest for voiturettes, tricars, and motor bicycles, under the auspices of *Les Sports* and the French Auto Cycle Club, commenced on May 22nd, and will finish on June 3rd. The daily stages average over 200 kiloms., and in the various classes the number of starters were: 13 tricars, 6 light motor bicycles, 7 one-third litre bicycles, and 4 voiturettes; the latter comprised a Vulpes, a Fouillaron, a Pellison, and an Auto-stand. At the time of going to press, with the exception of two of the smaller fry, the whole of the competitors were continuing successfully in the running, including the 20 kilom. climb up the famous Ventoux Mountains.

Dead Horse Hill Climb.

ON May 24th in a competition on this hill near Worcester (U.S.A.), the best time was made by an 80-h.p. Darracq, 1 min. 42 secs.; second, a Stevens, 1 min. 50 secs., and third, 80-h.p. De Dietrich, 1 min. $59\frac{1}{5}$ secs. Stanley's time, on his steam car, was 1 min. 44 secs. The hill has an average gradient of 12 per cent., with 15 per cent. in parts.

The 80-h.p. Christie Car.

AT the Empire City track, America, on Sunday last, Walter Christie, on his 80-h.p. racer, is reported to have equalled Barney Oldfield's record for the mile of 53 secs.

100 Miles "Non-Stop" Run.

IN connection with this event, organised by the Lincoln A.C., particulars of which we gave last week, the committee of the club have resolved to award the special prize, for the best performance over the 100 miles run, to Mr. C. W. Pennell, who drove a 16-h.p. Martini. An extra prize is given to Mr. G. Garnett (8-h.p. M.M.C.).

Speedometer Trials Awards.

THE following awards have been made:—

Jones Speedometer, Gold Medal.
Elliott Motormeter, Silver Medal.
Kirby Speedometer (experimental), Special Gold Medal for excellence of design, workmanship, and accuracy.

The order of merit is declared to be as follows:—

1. Kirby.
2. Jones.
3. Elliott.
4. Cowey Indicator.
5. Gratze.
6. Vulcan.
7. Cowey Recorder.
8. Warner.
9. Staunton.

Lamp Trials Awards.

THE following awards have been made:—

A. Gas generators (Worsnop and Co., Ltd.), no award.
B. Gas headlights (Worsnop and Co., Ltd.), no award.
D. Oil headlights* (George Polkey, Ltd.), no award.
F. Tail lamps (Corelanus tail lamp entered by Metallic Mirrors, Ltd.), Silver Medal.
F. Tail lamps (Ryta tail lamp entered by the Ryta and Hoult Trading Company), Silver Medal for excellence of the device for showing the driver if his lamp be alight or not.

* Withdrawn during trial.

Scottish Reliability Trial.—June 13th to 16th.

THE following further entries have been made at double fees:—

Benz and Co., 40-h.p. Benz.
Major J. W. Fraser, 10-h.p. Argyll.
Sidney Straker and Squire, Limited, 28-h.p. Straker.
Captain R. B. P. Lybbe, 30-h.p. 6-cylinder Standard.

French Grand Prix.

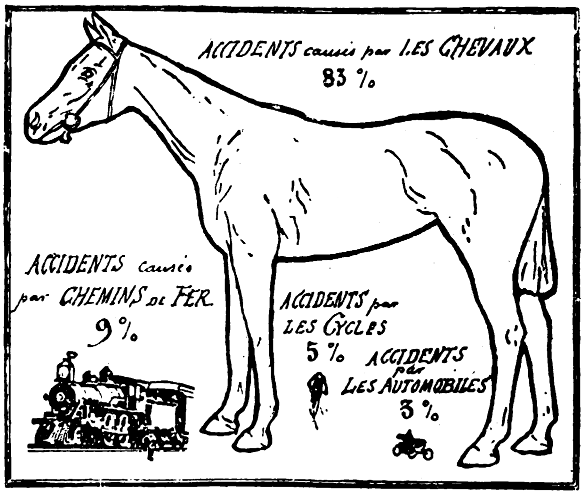
THE following is the result of the ballot for order of starting:—

1. De Dietrich; 2. Fiat; 3. Renault; 4. Darracq; 5. Brasier; 6. Mercedes; 7. Gobron; 8. Itala; 9. Gregoire; 10. Panhard; 11. Vulpes; 12. Hotchkiss; 13. Clement.

The cars of makers having more than one car entered will bear the same number plus letters, as follows, 1a, 1b, 1c, 1a starting 14th, and so on. There are 34 cars in all entered.

The Famous 200-h.p. Darracq Racer.

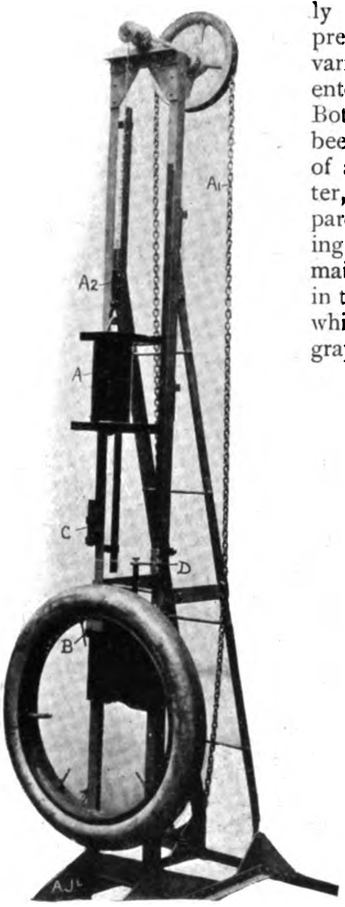
MR. A. LEE GUINNESS has just become the owner of this huge 8-cylinder world's record-breaker, one of its achievements being two miles in $58\frac{4}{5}$ secs.


ACCIDENTS causés par LES CHEVAUX
83 %
ACCIDENTS causés par CHEMINS DE FER
9 %
ACCIDENTS par LES CYCLES
5 %
ACCIDENTS par LES AUTOMOBILES
3 %

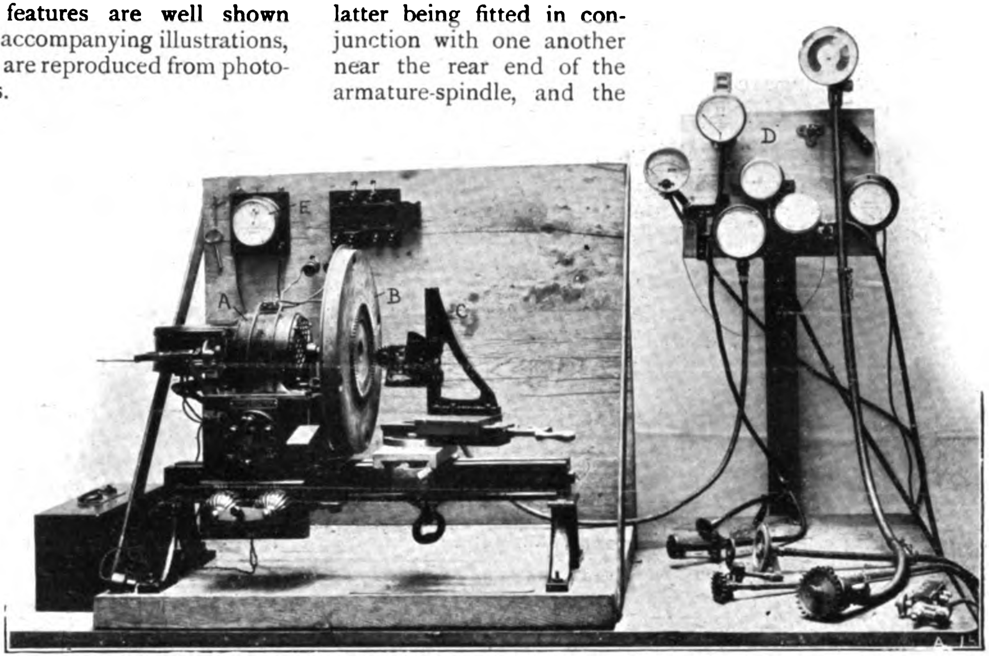
Accident Statistics.—A French method of bringing home to the public with which class of locomotion responsibility rests for the proportion of accidents which occur annually.

THE A.C.G.B.I. TESTING APPARATUS FOR TYRES AND SPEEDOMETERS.

IN connection with the recent trials conducted by the Automobile Club, a certain amount of special apparatus has been needed in order to obtain comparative data in the Motor House. For the tyre trials it was deemed advisable to make some experiments to determine the yield and return of each type of tyre, and for the speedometer trials it was obviously necessary to ascertain the precise degree of accuracy of the various instruments that were entered for the competition. Both the machines which have been constructed for this work are of a somewhat elaborate character, and both of them have apparently been successful in achieving the ends in view. Their main features are well shown in the accompanying illustrations, which are reproduced from photographs.



The Tyre-Testing Machine.



The Electrically-Driven Apparatus for Testing Speedometers.

Referring to the tyre-testing machine, which stands some 9 or 10 ft. in height, the wheel is supported upon a rigid bracket, B, that projects forward. This bracket fits closely up against the felloe at the top of the wheel, and, consequently the blow is localised on the tyre when the 40 lb. weight, A, is allowed to fall on the tread. For raising the weight, A, to the desired height, there is a hoisting gear that is operated by the chain, A^1, and for liberating it to allow the weight to fall in its guides, there is a trip-gear formed by the hand-controlled trigger-catch, A^2. When the weight falls, it carries the sliding-pointer, C, down with it, and when the weight rebounds it carries the other pointer, D, up with it. Both pointers are provided with graduated scales which thus enable the deflection of the tyre and the rebound, respectively, to be noted.

The other apparatus has an electric motor, A, that can be caused to rotate at any required speed, a face-plate, B, that is carried on one end of the armature-spindle, and an adjustable carrier, C, for enabling any type of speedometer to be coupled up to the motor. All the speedometers are fixed to the board, D, which represents the dashboard on a car, in just the same way that the face-plate, B, represents one of the front road-wheels. Other essential portions of the machine are a clock, E, a speed counter and an electro-magnetically controlled clutch, the two latter being fitted in conjunction with one another near the rear end of the armature-spindle, and the clutch being automatically controlled by the clock. When in use, the motor is first speeded up until the speedometer under test attains the desired reading, and then the automatic clockwork mechanism is brought into play. The clock causes the clutch to couple up the speed-counter with the motor, and, after having held it in engagement for 60 seconds, again liberates the speed-counter. During this period of time, the operator keeps the reading steady on the speedometer, and is then able to check it with the reading of the speed-counter.

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New Touring Car Record—180 Miles Per Hour!

MR. E. S. COCKBURN, of Sutton, near Chesterfield, is the owner of a car which, according to local police testimony (*plus* police watches), holds the record for speed on the roads. It is a trifle that to procure this testimonial Mr. Cockburn has had to contribute a £2 fine and £8 costs to diminish the local taxation of the district. A policeman maintained that the car was proceeding at the rate of three miles a minute, *and the Bench apparently believed him.*

MOTOR BOATING.

Motor Yacht Club.

MR. W. J. FERNIE, the new secretary of the club, has now taken up his quarters on the floating clubhouse, the "Enchantress," in Southampton Water. The London office of the club has therefore been closed, and communications should be addressed direct to the "Enchantress," Netley Abbey. A weekly visit, however, will be paid by the Secretary to 119, Piccadilly. The regular weekly cruises of the season commenced last week, the destination on that day being Burlesdon, two miles up the Hamble river, the Rear-Commodore having hospitably invited the members to tea on their arrival.

Motor Boat Racing Season.

THE first racing events of the season will be held by the British Motor Boat Club at Oulton Broad on Whit-Tuesday, June 5th, when there will be three races, including one for the Brooke Trophy, presented by Mr. Mawdsley Brooke, and three water gymkhana events.

On June 8th and 9th, the Club, in conjunction with the Liverpool Bay Yacht Club, hold at Liverpool some very interesting races, including a race, on the Saturday, for the Club's Flying Mile Cup.

Motor Boat Races at Lagny.

IN France, at the Lagny motor boat meet, on Sunday last, the Coupe de la Marne was secured by Delahaye-Nautillus in 1h. 13m. for the 40 kiloms.

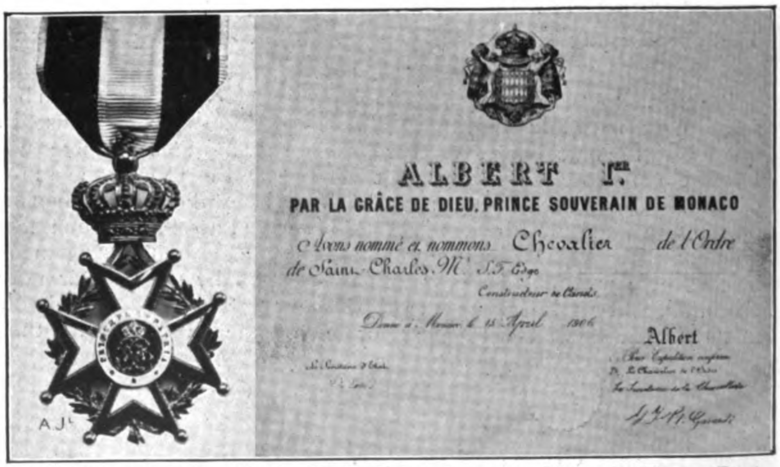
A Cruise in the "Napier Major."

TWELVE months ago the little motor cruiser, "Napier Major," owned by that motor enthusiast, Mr. S. F. Edge, made a record by successfully accomplishing a voyage to the Shetland Islands, from the Thames, and returned by way of the east coast, calling at numerous ports before again reaching London. This season, an even more ambitious record is being attempted, for the boat has been despatched to make a circuit of Great Britain, "North-about," but escaping the rough waters of the Pentland Firth by making a passage of the Caledonian Canal to the West Coast of Scotland and thence on, *via* Oban, Belfast, and the Isle of Man to Liverpool, where she is due for the motor boat races in connection with the Liverpool Bay Yacht Club. It was the intention to make a long non-stop run as far as Inverness, as there was every prospect at the outset of the weather being favourable, but, as usual, the weather upheld its reputation for fickleness and prevented the designed programme from being carried out.

After passing the Tyne piers the fog came down so heavily that the electric light, ordinarily visible for 17 miles, on St. Mary's Isle to the northward was not picked up until we were within a mile of it. Here the fog came in thicker and the ship's way was stopped in order to take some soundings, and if possible, feel our way into Blyth Harbour. Finding no bottom with the hand lead, we stood in to the land, occasionally stopping, and again sounding; bottom was got ultimately at 11 fathoms, and again we stood in, keeping St. Mary's Isle light in view. Suddenly the high land loomed ahead and the roar of breakers could be heard plainly. The helm was shoved hard down and we stood off the land again, still holding to St. Mary's light, and now an uncomfortable thing happened. We knew that we should be steering S.E., but our steering compass aft for some time stuck with "North" to the lubber's point; that it was not reliable was soon proved by reference to our standard compass amidships, but it was impossible to steer by this as it was hung below in the cabin and could be seen only from there or from a glass porthole in the cabin top. Eventually our anchor was let go in six fathoms, and the night was spent in keeping an anxious watch relieved only by the rolling of the vessel in the swell and the hootings of passing steamers, suddenly looming up, and passing by like eerie shadows in the fog, and the energetic ringing of our little bell to denote "a ship at anchor."

As the fog still continued on the next day, "Skipper Hearman" deemed it prudent to make for Blyth Harbour, and accordingly we felt our way in with the lead, and brought up in the Inner Basin by 8 a.m. The first thing done after making fast was to secure the services of a compass-adjuster, who found the "stone" of the after compass to be cracked. Hence our difficulties of the night before. The trouble was at once remedied, and since then our after compass has shown due respect for the magnetic North. Friday and Saturday was spent in patiently waiting for an improvement in the weather, but it was not until noon on Sunday that the sun once more shone out, and the last of the haze drifted away before a light south-easterly breeze.

That same night the English coast was left behind, and Rattray Head was passed at the close of the next day, and we entered the Moray Firth and set our course for Inverness. The night was fine and remarkable for a peculiar clearness of the sky and atmosphere towards the north, whence a light, but refreshing, breeze had now sprung up. A swell of some weight, too, soon after set in from the same direction, and this, combined with the general appearance of the weather, and the fact that the barometer, which had been steady all day, had begun to "tumble down," made us doubtful about reaching our destination



ALBERT Ier

PAR LA GRÂCE DE DIEU, PRINCE SOUVERAIN DE MONACO

Avons nommé et nommons Chevalier de l'Ordre de Saint-Charles Mr S. F. Edge

Constructeur de Canots

Donné à Monaco le 18 April 1906

Albert

Following the return of Mr. S. F. Edge from the Monaco Motor Boat Race Meeting, His Highness the Prince of Monaco was pleased to constitute him a Chevalier of the Order of St. Charles. We are able to reproduce above the brevet and insignia of this Order, of which Mr. Edge has been the fortunate recipient.

without further troubles. At 1 a.m., or soon after, the wind suddenly came away from the north, and in a few minutes piped its song in our scanty rigging. The first blast was succeeded by others in increasing intensity, and accompanied by reminders of the frozen north in the guise of sleet, hail, snow, and ice-cold rain. The sea rapidly rose with the wind, and the heavy swell soon gave its weight upon our beam. We had no shelter to run for except back to Fraserburgh or Peterhead, and this we were loth to do. We had done with the eastern points of the compass for a while, and as it was too murky a night to risk recognising and running for one of the small fishing ports on the coast leeward of us, we had no alternative but to hold on.

Dawn, which broke upon us soon after 3 a.m., found the little "Napier Major" in a vast wilderness of foam-topped waves. Occasionally a view would be got for a second or two of the highlands of Cromarty, on the N.W. of Perth. Our little craft was tossed about like a cork. How she rolled! The swinging table below in the cabin stood at times perpendicular to the floor below it, and the recovery from every roll was so rapid that it was practically impossible to do anything but jamb oneself against something, anything in fact which came to hand or foot. Below, beds, clothing, books, and food, chased each other across the cabin in a sodden race. On deck, Hearman at the tiller, clad in oilskins and warm clothing, and blue stockings stowed in capacious sea boots, bent his head to each succeeding sea that threw its crest aboard, and beat our little ship's side with resounding noise. All might go well if only our scant canvas would hold, *and the engines!* How anxiously, from time to time, we glanced at them, and with what a startled look of enquiry did Blythe, our engineer, cry out, "What's that?" as a crash came from the stern. Our nerves were all at full tension, for each recognised the danger. Happily, the alarm was caused by nothing more than a tin bucket getting adrift, and jamming itself into another tight corner. For five hours Hearman stuck to the tiller, and met each on coming and roaring sea as only a practical hand can do. By 6 a.m. we picked up the entrance to the Cromarty Firth, and then, altering our course, bore away, and ran before the still increasing gale. The seas chased the "Napier Major," and although for awhile it almost seemed that they would overtake and engulf her, we pulled through our weary warfare with a mightier power than any devised by man, and by 8 o'clock were passing between Fort George and Fort Rose, and so into Loch Fyne, on the way to Inverness and the Caledonian Canal, where "Napier Major" is now moored.

We are in Inverness at last. Ten days from leaving the Thames. Our actual time at sea, 116 hrs.; total time of engine running, 96 hrs. Our engine was only stopped on four occasions, and then only because we were either forced to seek shelter or to anchor. It had run without a hitch or check of any kind, and, if it had never been tested before, it had a sufficient trial for eight hours on end in the Moray Firth. "The climate of Inverness is genial," so speaks the local guide book, and such books never exaggerate. At present it is raining and blowing only a shade less energetically than it did forty-eight hours ago when we arrived. Our time in the interval has been occupied by eating hot food and sleeping—mostly sleeping; the whole of our bedding and gear is drying before a roaring fire in this most comfortable Muirtown Hotel. Our passage through the Caledonian Canal to-day will, alas, be anything but a pleasant one, it is to be feared, and the scenery looked forward to will be invisible on account of the rain and mist descending from the surrounding mountains, but we are due in Liverpool, and have other ports to touch at, and cannot wait for the weather to clear up. We will take it for granted that Scotland is bonny Scotland still around us. L. S.

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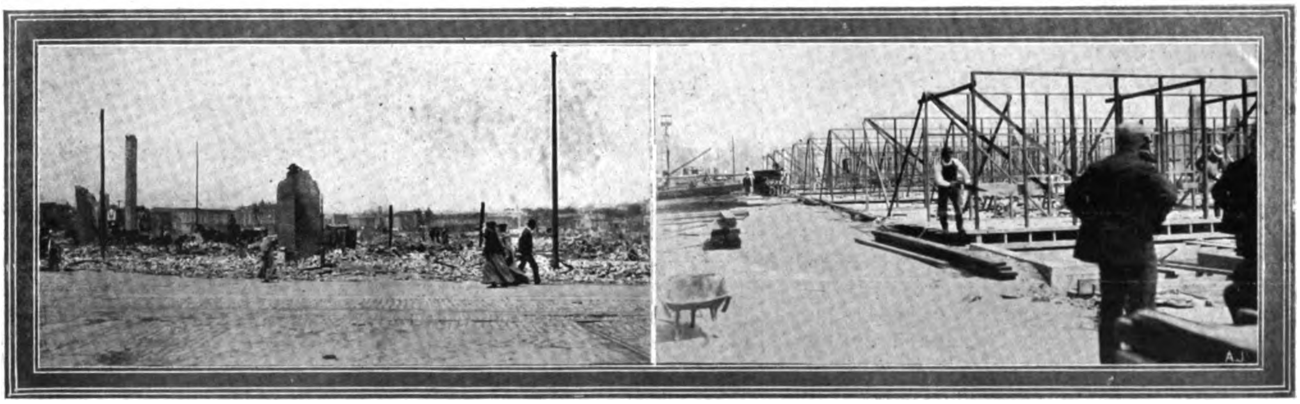
No Further Issue of Daimlers.

THERE seems to have been a notion circulated abroad to the effect that the Daimler Company intended making a further issue of capital. This belief is without any foundation whatever, and the directors have accordingly issued a statement that, though the business of the Company is increasing largely, no such issue will be made, as their present resources are entirely sufficient for dealing with all prospective increase in their trade.



SAN FRANCISCO EARTHQUAKE DISASTER.—It will be remembered that recently we were able to reproduce some very striking photographs depicting the fearful destruction which had been created in the city of San Francisco. In the clean sweep made of most of the town, the White Steam Car Garage foundations were completely obliterated. That no time has been lost by those who have interests in San Francisco may be judged from the two photographs above. In that on the left will be seen the remains, after the fire, of the White Garage at No. 1878 Market Street, and in that on the right the commencement of the new buildings, three days' work on the new White Garage being in evidence in our photograph. It is the first building of any size to go up in San Francisco since the fire. As will be noticed, it is only a one-storey building, but this is due to the fact that the Building Committee will not allow anything else to be erected for the moment in case they may change the plan of San Francisco in the future, and lay it out to better advantage than before.

CLUBS AND ASSOCIATIONS.

Motor Union.

THE AUTOMOBILE HANDBOOK FOR 1906 is to be published this week. It has been largely increased in size, and now consists of over 700 pages. It contains a vast amount of information essential for motorists to know in connection with the organisation and legal side of the automobile movement, and is further a complete guide to touring both at home and abroad.

North London A.C.

LAST Saturday the Club were the guests of their President, Colonel Bowles, at his charming old mansion, "Forty Hall," Enfield. There were over a hundred members and friends present. After tea, taken in a marquee, a "Coach-house" race was held in a part of the grounds near the lake. Mr. Charles Smith, the hon. sec., was again successful in winning the first prize. The following is the order in which the competitors finished:—

Mr. Charles Smith ...	12-h.p. Darracq ...	23·2 secs.
Mr. Max Graddon ...	15-h.p. Panhard ...	29·2 ,,
Mr. W. Cornwall ...	16-h.p. Albion ...	39·4 ,,
Mr. Lendrum	10-12-h.p. Darracq	41·2 ,,
Mr. W. Holmes ...	12-h.p. Darracq ...	44·4 ,,
Mr. F. Horton ...	6½-h.p. Darracq ...	46 ,,

The undermentioned were disqualified in consequence of their cars touching the hurdles:—Messrs. Alexander, G. Smith, Bransom Griffiths, and E. Swingler.

Society of Motor Manufacturers and Traders.

AT a meeting of the Management Council last week it was announced that the plans for the Society's November Exhibition at Olympia had been definitely approved by the London County Council. The date of the ballot was fixed for Thursday, June 8th, at 2.30, at Maxwell House. This will be the first time that the Society will have held its ballot on its own premises.

With reference to the proposed Commercial Vehicle Trials, the recommendation from the Commercial Vehicle Section was considered and approved and a recommendation was made to the Automobile Club accordingly. Correspondence with the Scottish Motor Trade Association was reported, this Association desiring to work in harmony with the Society. The memorial to the Railway Clearing House, prepared by the London Chamber of Commerce jointly with the Institute of British Carriage Builders was sealed.

MOTOR CYCLING.

Land's End to John O'Groats.

ENTRIES for this trial, organised by the Auto Cycle Club, which takes place from June 11 to 16, has brought together no less than ninety-three entries, of which twenty-four are entered in the Passenger Machine Class, the remainder, sixty-nine, being in the Motor Bicycle Class. Practically every type of known machine is down to take part, and the Auto Cycle Club are to be heartily congratulated upon the successful start of their contest. The most remarkable point about the entry list is that sixty of the machines are entered by private owners.

International Cup Race.

"'TWAS the dog that died." Within the last week, following a number of rumours to the effect that the International Cup for Motor Cycles was not likely, after all, to be held on July 8th by the Austrian Club, an official pronouncement has been made by the President of the Austrian Club, Herr Robert Siercke, in which he states that the rumours are entirely false, as there is not the slightest question as to the race taking place under any circumstances, it being even anticipated that a number of the Austrian Royal Family will be present. That the race also promises to be a pronounced success is also a source of considerable gratification. Curiously, within a day or two of this public announcement by the President of the Austrian Club, comes an official notification from the Moto-Cycle Club of France that their Motor Bicycle Championship is postponed from June 17th to September. This race on the Dourdan course, it will be remembered, was suddenly sprung upon the motoring world in the earlier part of the year, it being hoped that this would, in similar fashion to the suppression of the Gordon-Bennett Race for cars, give the *coup de grace* to the "Little Gordon-Bennett" Race. Fortunately, to save their face, the French Club have, on the grounds that the strikes prevent the competing firms from getting their machines ready in time, announced their "desire to give satisfaction to the very courteous and very just demands of the Austrian Club," that the date of the Championship Race should be altered. Another excuse advanced is that, by the postponement, it will be possible to make the Championship Race partake more of an international character.

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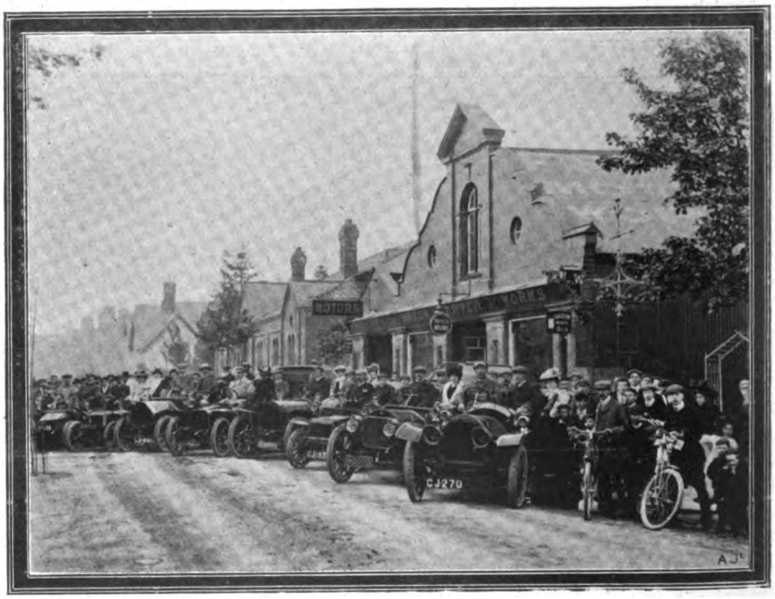
The Taxameter Motor Cab.

IT is satisfactory to learn that the new motor cabs which are being put on the London streets will add to their other attractions the employment of a taxameter. The presence of this instrument on the vehicles will ensure to the fares that there can be no possible dispute with the driver as to what they have to pay. The motor cab will accordingly possess the advantages not only of much greater speed and enormously greater range than its horsed rival, but one of the principal causes that deterred the average well-to-do man from taking a cab when he otherwise might, the prospect of a disagreeable dispute at the end of his journey, or the consciousness of having paid more than he need have done, will be removed. A great deal of misconception has found its way into the general Press on the subject of the taxameter. The modern instrument of that description registers the time that the vehicle is standing in exactly the same way as it registers when it is proceeding through the streets. Of course, if the vehicle comes to a dead stop in traffic, the machine registers as if it were a wait. But that is, after all, only fair to the driver. We feel convinced that when the British public has become accustomed to the taxameter, the saving in fares which will be effected, will result in the cabmen getting not smaller but considerably larger *pourboires* than hitherto.



The occasion of the Herefordshire A.C. Fromes Hill Climb last week was taken advantage of by Mr. J. Fryer, for opening his new motor garage at Ladminster. Our photograph shows the company who assembled in honour of the inauguration.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

CUBIC CAPACITY AND EFFICIENCY.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Referring to Mr. Weigel's letter with reference to myself in your last issue, I did not merely suggest that a Faraday House test had been taken of the 40-h.p. Napier, I actually quoted an extract from the Faraday House test showing that this six-cylinder Napier which Mr. Weigel thought would not give 40 h.p. did actually give 45 h.p.

I know nothing of Mr. Weigel's verbal challenge, but as he made a public challenge to me in the newspapers I have accepted his challenge in the same public manner. His challenge is quite clear and reads as follows:—

"I will undertake to purchase from him (Mr. Johnson) a 6-cylinder Napier (4 ins. by 4 ins.), for the full catalogue price, plus £100 commission for himself, subject to a Faraday House test that it will take a load of 40 h.p. for two hours."

As soon as possible I got Mr. Napier to communicate with the Faraday House officials and they made the test and certified the size of the engine. Surely Mr. Weigel is not going to suggest that the very authorities which he himself suggested as satisfactory to him are not the right and proper people to carry out the test. I myself was not present when the test was made as I had no doubt that the Faraday House officials were quite competent to make a correct and fair test, and all I did was to ask Mr. Napier to have the test made by the properly constituted authorities of whom Mr. Weigel himself approved when he made his challenge.

I enclose herewith the certificate given by the Faraday House authorities, and as you will see it is signed by their principal.

I trust that this is satisfactory to your readers and that Mr. Weigel will cease from wriggling and pay the money which he has lost. His challenge is clear, the test is clear and made by his own nominees. All that is left for him to do is to honourably pay the wager he has lost.

Yours truly,

May 25th. B. JOHNSON.

[Copy of Certificate Enclosed.]

Faraday House,
62, 64, 66, 68, and 70, Southampton Row, W.C.,
May 16th, 1906.

To Messrs. D. Napier and Son,
Engineers.
Acton Vale, London, W.

REPORT UPON NAPIER PETROL ENGINE TESTED AT ACTON, ON MAY 10TH, 1906.

In accordance with your instructions we have tested the above-named engine at Acton, and beg to report as follows:—

The engine was numbered 828, and had six cylinders, 4 inches diameter, the stroke being 4 inches. It was direct coupled to a brake drum, and the following test carried out:—

The engine was run for twenty-six minutes, whilst the apparatus was being adjusted, and after a stop of a few minutes, the test was started, and continued for two hours four minutes. The average load throughout this period was 43 b.h.p., the maximum load being 45·8 b.h.p., and the minimum 42 b.h.p.

After this test was completed a test was made to ascertain the maximum load the engine could maintain. Over a run of ten minutes' duration, an average load of 47 b.h.p. was maintained, the maximum reading being 48·3 b.h.p., and the minimum reading 45·9 b.h.p.

No allowance has been made for the power consumed by the friction on the bearings of the brake drum.

(Signed) HUGH ERAT HARRISON, Principal.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As is well known a few interested people have, in some cases, flatly contradicted the marvellous horse-power that is obtained from the relatively small 6-cylinder Napier engines of 301 cubic in. capacity.

All engineers familiar with 4-cylinder engines believe it to be absolutely impossible that an engine of this size could develop anything like the horse-power that Mr. Napier obtains from the 6-cylinder, and to clinch the matter, a daring gentleman, evidently without knowledge on this subject, boldly rushed into the breach, and made a challenge that he would pay a large sum of money if a Faraday House test was made of the standard 4 in. by 4 in. 6-cylinder Napier engine, and if on this test it would give 40 h.p. for two consecutive hours.

Up to the time of writing this gentleman has not been so anxious to pay his forfeit as he was to make the challenge; but, so that the British manufacturers may for ever have it clearly recorded to their credit that they have succeeded in producing a 6-cylinder engine which will give up to 48 b.h.p. with only 301 cubic in. capacity, I enclose you a copy of the actual certificate given by the Electrical Standardizing, Testing, and Training Institution.

Yours truly,

May 25th. S. F. EDGE.

P.S.—You will notice that the horse-power developed is really more than that indicated, as no allowance was made for the friction of the brake drum bearings.

THE QUESTION OF TYRES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—With reference to the troubles which Mr. Cecil Edge had on his gearless car on the occasion of his 1,000 miles run with metal-studded non-skid tyres, we would like to mention that the tyres he used were not "Continentals," as might be understood from a certain advertisement which appeared in several of the trade papers.

The "Continental" tyres with steel studs have been proved over many thousands of miles on many types of cars.

They were used by Mr. Charles Jarrott on occasion of his successful run from London to Monte Carlo, and he wrote us to the effect that the tyres had gone through splendidly *without a puncture*, and without trouble of any description.

Mr. S. F. Edge also wrote us after an extensive trial with our steel-studded non-skid tyres, expressing his entire satisfaction, as did Capt. H. H. P. Deasy after his successful Ballock Hill Climb.

The steel-studded "Continental" non-skid tyres are the results of years of experiments carried out by us, and there is no question but that they are the finest tyre of their kind on the market.

We should feel obliged if you would bring this fact—that no "Continental" tyres were used on Mr. Cecil Edge's car—before the notice of your readers.

Yours faithfully,
PAUL BRODTMAN,
For the Continental Tyre and Rubber Co. (Great Britain), Ltd.

May 28th.

COMMERCIAL POINTS.

MESSRS. DE DIETRICH, of Luneville, France, are fortunate in connection with the French strikes, which have been creating such trouble lately. Their men, we learn, resumed work last week, and business is now proceeding more rapidly than ever, in the hope of making up for lost way. At one time Messrs. De Dietrich were very exercised in regard to being able to get their racing cars ready for the Grand Prix, a contingency which now, by day and night work, they will be able to overcome.

THE Singer tri-car, which won the Haslemere Hill-Climb on May 19th last, had, we learn, for its electrical equipment, a "Castle" induction coil and "Castle" accumulator.

ARIES, LTD., have, at 6, Great Marlborough Street, opened a very excellently-equipped show room, where they are now able to exhibit the Aries cars to advantage. Mr. G. H. Norris, who has been associated with Messrs C. S. Rolls and Co. and Messrs. James and Browne, is in charge of the Aries establishment as manager.

THE new 45-h.p. Mercedes car delivered to His Majesty the King, is fitted with Continental tyres, as was also the Daimler car which won the hill climb up the mountain known as "Giant's Despair," Wilkesbarre, Pa.

MAJOR T. MCNALTY, in charge of the Army Mechanical Transport, has placed an order with the Arrol-Johnston Agency, Ltd., London, for one of the new "Arrol-Johnston" cars for his private use.

THE remarkable testimony, in connection with his recent continuous run across the Continent from Nice, given by the Hon. C. S. Rolls to the sustaining and feeding qualities of the "Plasmon" food preparations, confirms others' experience in the use of these palatable dainties. The little Plasmon luncheon packets, which include biscuits and chocolate, are conveniently small for the pocket, and are quite sufficient for most people for three or four hours. Motorists can never be wrong in having one or two of them in their "kit." The occasion of the forthcoming Scottish Trial should be a good opportunity of putting these foods on a trial of their own.

Fromes Hill Climb. —On duty.

A Sultan in the Wrong.

W. G. SMITH was, on Monday last, fined 40*s*. at Bow Street for driving the Sultan of Zanzibar along the Victoria Embankment at a speed of 26 miles an hour. Both the Sultan and his private secretary said they thought the speed was moderate, but the magistrate, as usual, convicted.

To Benefit Reigate Hotels.

REIGATE is about to acquire an ornament to its police force likely to have a distinctly depressing effect on the business done by hotel keepers and all connected with them. Inspector Jarrett, who has recently been practising in the neighbourhood of Egham, is, at an early date, to be transferred to Reigate. The people of Reigate are wondering what they have done to deserve this visitation.

The Vanguard Strike.

THE Vanguard strike, to the pros and cons of which we refer editorially, has been happily settled. Mr. P. W. W. Wilson, M.P., and the Rev. J. Holmes, were appointed to wait on the company with a view to settlement. The managing director was willing that the men should appoint a committee to discuss their grievances at an early date, and agreed to take back all the men who have been on strike. And thereupon the "unpleasantness" came to a conclusion.

Rhodesian Interest in Automobilism.

THERE is a "guild of culture" in far away Rhodesia, and recently at the Presbyterian Hall in Buluwayo, a lecture was given by Dr. Appleyard on "Modern Mechanical Road Transport in the Future Development of Rhodesia." In this paper he discussed the relative merits of automobile transport, and the comparative advantages of rail and road locomotion. As everyone else acquainted with the country has previously pointed out, Dr. Appleyard observes that an adequate system of roads is a *sine qua non* before it can be fully developed by automobile. Dr. Appleyard appears to favour steam cars using kerosene as fuel as a means of propulsion in that part of the country, if for no other reason than that the cost of petrol is prohibitive, being from 5*s*. 6*d*. to 6*s*. 6*d*. a gallon.

The Polytechnic Course.

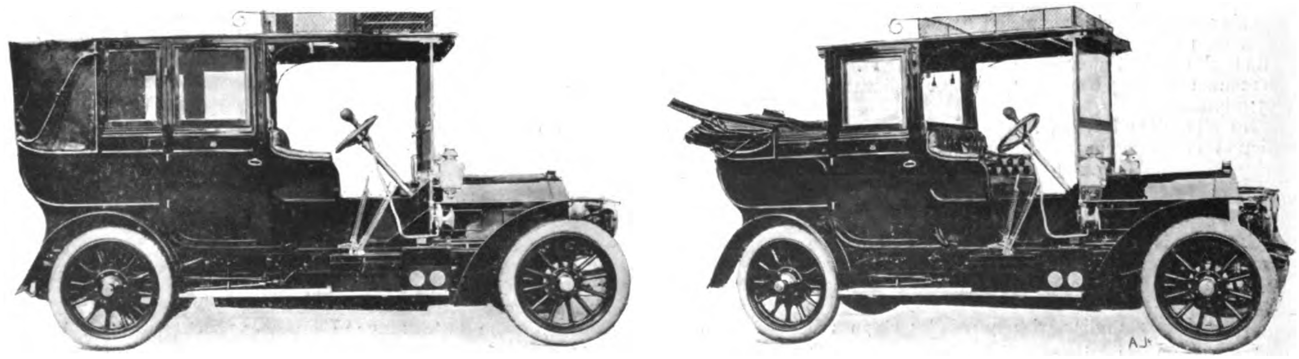
THE Polytechnic course of motoring instruction has recently been considerably developed, and a very fine series of lectures and practical instruction, including driving lessons, is at the service of those who desire to avail themselves of it. We are pleased to note as evidence of the up-to-date character of the instruction, that the laboratory is fitted with a Walker dynamometer, and a Hospitalier-Carpentier manograph, while amongst the text-books recommended figures the treatise of THE AUTOMOTOR JOURNAL on High-Tension Magneto Ignition Systems.

A Magistrate on Unfairness.

MR. GEORGE WRIGHT, the magistrate at the Willesden Police Court, recently read the police a lesson (we are glad to say) on the subject of police motor traps. They had arranged a contrivance of this sort on the Edgware Road, near Hendon, into which Mr. George Isaacs, of Venetian Road, Lambeth, driver to Lord Hampden, incontinently fell. Lord Hampden wrote to the Court pointing out that the trap was not at a fair spot, a view which Mr. Wright also adopted, and in fining Isaacs £1, suggested to the police ("suggested" is good) that a long stretch of straight road should not be selected, but that they should place their traps at dangerous spots. But how about the convictions that are necessary for the advancement of the man in blue?

Motor 'Buses Contaminating Drinking-Troughs.

IT appears that amongst the other misdeeds of the motor 'bus it now stands charged with "poisoning the enemy's drinking supply." Motor 'buses, it is stated, have been in the habit of taking water from horse-troughs, and partially replacing it with lubricating oil, which the horses have not found a palatable substitute. The Town Clerk of Westminster has accordingly warned "persons" that the water is the property of the Council, and that "any person found taking it for any purpose other than that for which it is provided, or in any way rendering the water unfit for animals to drink, are liable to be prosecuted." The literary style of the Westminster Town Clerk, it will be observed, is not above reproach. It is also of interest to note that paragraphs dealing with this subject have been headed in the daily Press "Omnibuses Poison Horses."



Last week we reproduced photographs of a perfectly designed car as an example of the very pleasing lines to which the up-to-date motor car has now attained. In the above photographs another example of this character is seen. This car is a 28-38-h.p. Ariel-Simplex landaulette owned by Mr. R. Anderson, of Giffnock.

A Compensation.

Such a fuss has been made about the injury to crops caused by the dust distributed (but not produced) by motor cars, that it is interesting to hear that, according to the Chairman of the Westbury District Council in Wiltshire, the dust has the effect of killing the flies on turnips.

A Car with Four Speeds on the Reverse.

This is the latest development of the Clement-Talbot car. There is a vehicle made by that well-known company which gives, or did till quite recently, one very slow speed forward and four varying speeds backwards. Needless to say, this car, which belongs to a country doctor living not very far from Nottingham, did not leave the manufacturers with these peculiarities. They were acquired by it in the hands of a country motor car repairer, who, apparently without adequate reason, dubbed himself "engineer." He had put the bevel gear together on the back axle in the wrong way, and this was the result. The doctor's friends, on seeing the car being put through its new paces, suggested that he would invariably have to arrive on the scene backwards, unless he wished his patients to recover before he reached them. The tragedy certainly emphasises the fact that there are a good many would-be repairers about the country whose qualifications are not all that might be desired.

PUBLICATIONS RECEIVED.

The Badminton Library. Motors and Motor Driving. By Lord Northcliffe and other writers. London: Longmans, Green and Co. Price 9*s.* net.

Woodhall Spa, Weston-super-Mare, Bournemouth, Southport, Deal. Five volumes of the official publications of the Urban District Councils. London: The Health Resorts Development Association, 2, Gray's Inn Road, W.C.

Throup's North of England Cyclists' and Motorists' Guide. Bradford: T. Throup.

Practical Motor Car Repairing. London: Percival Marshall and Co. Price 1*s.* net.

Motor Cycles and How to Manage Them. London: Iliffe and Sons, Limited. Price 1*s.* net.

COMPANY DOINGS.

Deasy Motor Car Manufacturing Company, Ltd.

At the statutory general meeting of the shareholders of this company, when Captain H. H. P. Deasy presided, a very satisfactory statement of affairs was laid before the members of the company.

Captain Deasy announced that 80,000 shares had been allotted, all of which had been allotted for cash only; preliminary expenses, including brokerage, &c., was £940 1*s.* 6*d.* less than had been allowed for in the prospectus; Mr. William Murray, a partner in Williamson, Murray and Co., Ltd., had joined the board since allotment, and the company, which had lost no time in taking possession of the Iden factory, had immediately obtained sufficient machinery of the latest type for the manufacture of their cars. The extension which they were making to their factory would cover an area of about three-quarters of an acre, and this was well advanced, the whole of the building being designed with a view to economical and rapid production. Every endeavour was being made to expedite the delivery of the first few cars, but the board had determined upon the policy of postponing the mention of dates for delivery until the first cars had concluded satisfactorily the very long and severe road tests to which they would be subjected at the earliest possible moment. The company also, he announced, had established a separate department for the manufacture of the bodies of their cars, and to give an idea of the future success likely to attend their company, he mentioned that a large number of enquiries for the Deasy cars were already being made, far beyond their expectations, and that agencies were being sought for at home, the Continent of Europe, America, and the Colonies; whilst an offer had been made in one direction to purchase the entire output of the factory for a period of years. It was, however, considered premature to close with this offer, and the board would have first to be convinced that such a course would be for the future benefit of the company. The cars, he said, would be of 24-h.p., and sold complete at a moderate price. The manufacture of vehicles for commercial purposes the company had not yet commenced, as the board did not consider it advisable to do so until the regular delivery of pleasure vehicles was in full swing. Their repair department was now, he said, in working order, and they were in a position to undertake the repairs of all types of petrol vehicles, make new gears and other parts, &c., at the very shortest possible notice. He was glad to say that the company had secured the services, as manager, of Mr. W. G. Williams, who until quite recently was general manager of the Collier Tyre Company. Mr. Williams would have charge of the commercial side of the business under the control of the board. Captain Deasy also paid a very marked compliment to Mr. E. W. Lewis, not only in regard to his remarkable qualities as a designer, but also referred to the proof which Mr. Lewis had given of his ability as a rapid organiser of such works as the company now possessed.

NEW ISSUES.

Motor Traction Company, Ltd.

At the meeting of shareholders, on Tuesday, the necessary resolutions were passed for the sale of the undertaking to a new company, upon the terms published in The Automotor Journal of last week.

London Road Car Company, Limited.

An issue has been made this week of 10,000 5 per cent. cumulative preference shares of £10 each by the London Road Car Company, Limited. The object of the issue is to enable the Company to complete the conversion of their business from horse to mechanical traction. Contracts have been entered into with leading manufacturers, it is stated in the prospectus, for the delivery of a large number of suitable motors, and the Company hope to be in possession of about 260 motors by the end of the present year.

Gearless Motor Omnibus Company, Ltd.

The capital of this company is £220,000 divided into 215,000 ordinary shares of £1 each, and 100,000 deferred shares of 1*s.* each. This week an issue is being made of 215,000 ordinary shares. The prospectus states that the company has been formed for running motor omnibuses in London and the suburbs on the system known as the "Gearless, or Auto-Mixte." The earning powers are calculated upon a basis of 120 gearless motor omnibuses, each earning a net profit of 2½*d.* per mile and 20 Turgan omnibuses, each earning 2*d.* per mile, on a run of 100 miles per day. It is estimated that this should give a profit per annum of £42,430 (apart from any receipts which may accrue from advertising), which provides for a dividend of 10 per cent. on the present issue of ordinary shares, leaving a balance of over £20,000 profit for administration expenses, reserve fund, further dividend on ordinary shares, and dividend on deferred shares. The preliminary expenses are estimated at £7,500, which expenses are undertaken by the Cerol Syndicate, Ltd. For this liability the Syndicate receive £7,500 in cash, and the whole of the deferred shares as fully paid, and the right for twelve months to subscribe for, at par, any of the unissued capital of the Company. The Cerol Syndicate, in addition, hand over certain contracts specified, which include an arrangement with the London and Paris Motor Company, Ltd., to supply 150 Auto-Mixte chassis at £720 each, and the right to a licence to use 300 equipments of the Auto-Mixte system, this latter privilege being granted in consideration of the payment of a sum of £3,000, and a royalty of £30 for each Auto-Mixte supplied. Also other contracts are included—with Messrs. J. Liversidge and Son, Ltd., for the supply of bodies for the chassis at £150 per body, and with the Tudor Accumulator Company for the maintenance of the working parts of the accumulators at a cost of £10 per annum. A commission of 10 per cent. is payable to the Cerol Syndicate for underwriting 53,000 of the ordinary shares.

The directors are Messrs. E. Manville (chairman of the Daimler (1904) Motor Company, Ltd.), Mr. J. J. Newbold (chairman of the London and Parisian Motor Company, Ltd.), G. H. Hopkinson (director of the Kensington and Knightsbridge Electric Lighting Company, Ltd.), Frank Rawson (late manager Uganda Railway), and P. Dawson (Messrs. Kincaid, Waller, Manville and Dawson). The general manager is Mr. W. Spiller, late superintendent and engineer, motor department, London General Omnibus Company, Ltd.

NEW COMPANIES REGISTERED.

Earl's Court Motor Garage Co. (Ltd.).—Capital, £2,000 in £1 shares.

Gearless Motor Omnibus Co. (Ltd.).—Capital, £220,000 in £1 shares (100,000 deferred). Chief objects, to adopt an agreement with the Cerol Syndicate, Ltd., and to carry on the business indicated by the title. First directors: E Manville, P. Dawson, F. Rawson, G. H. Hopkinson, and J. J. Newbould.

London and Continental Electric Carriage Co. (Ltd.).—Capital, £120 in £1 shares. First directors: A. R. Wagg and A. J. Schwelm.

Patin Tyre Syndicate (Ltd.), 13, Clifford's Inn, E.C.—Capital, £1,200 in £1 shares. Objects, to acquire a patent tyre invented by O. Patin, of Paris. First directors, A. C. Hills, W. R. Manning, and E. G. Williams.

Radford Bros. (Ltd.).—Capital, £5,000 in £1 shares, Objects, to carry on the business of motor car, omnibus proprietors, &c.

Transit Development Syndicate (Ltd.), 56, Lincoln's Inn Fields, W.C.—Capital £1,500 in £1 shares. Objects, to build and deal in motor cars, omnibuses, &c. First directors, S. H. Endie and W. T. Windsor.

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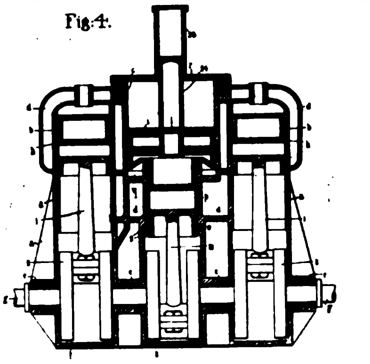
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

27262. 30th December, 1905. Improvements in or relating to Internal Combustion Engines. John W. Eisenhuth, 25, Broad Street, New York, U.S.A. This invention relates to internal combustion engines, and has for its object a type of engine wherein the cylinders operate in sets of three, two of which are adapted to work as high-pressure cylinders and one as a low-pressure expansion cylinder, whilst the power of the engine may be increased by using either one or both sides of the low-pressure cylinder as a high pressure engine taking in and exploding its own charges of gas There are eleven figures. Fig. 4 shows a section of the engine. *a* is a casing in which are two high-pressure cylinders, *b*, and one low-pressure cylinder, *c*, the latter being arranged between the former. *d* are water-jackets arranged to cool the high-pressure and low-pressure cylinders. The casing, *a*, has downwardly projecting brackets which, together with brackets in the crank-case, *f*, form bearings, *e*, for the crank-shaft, *g*. The pistons, *h*, of the high-pressure cylinders are connected by rods, *i*, with cranks, *k*, which are in the same angular position on the shaft. The piston, *l*, of the low-pressure cylinder is connected by a rod, *m*, with a crank, *n*, which stands at 180 degs. to the cranks, *k*. The piston, *l*, is formed on its underside with a trunk, *o*, working in a cylindrical guide, *p*, at the bottom of the low-pressure cylinder. By this construction a space is left at *q*, beneath the piston, *l*, in which space explosive charges may be caused to operate on the underside of the piston, *l*. The cylinder, *c*, is formed with a cover-plate, *r*, and the piston may be inserted from above by tying in the packing-rings, *s*, for the trunk, *o*, before fitting the rings, *t*, on the main portion of the piston. The cord used for tying in the rings, *s*, will be destroyed by the heat the first time that the engine is put to work. The valves for controlling the admission and exhaust of the gases to and from the respective cylinders are arranged all at one side of the engine. Gaseous mixture is introduced into a pipe, which distributes the mixture to the valves of the high-pressure cylinders, *b* The cylinders, *b*, which work on the four-stroke cycle, take in charges of gaseous mixture at alternate revolutions of the crank-shaft, *g*, so that whilst a charge is being drawn into one cylinder the working stroke is taking place in the other, whilst during the exhaust in the one cylinder compression is taking place in the other. The engine thus works normally as a compound gas engine, and as such it has high efficiency, because the gases are utilised to the best advantage, whilst the exhaust is comparatively odourless, owing to the complete combustion of the gases. The low-pressure cylinder may have an igniter fixed in any suitable position to ensure the complete combustion of the gases under all circumstances. For obtaining increased power from the engine, the underside of the low-pressure piston, *t*, is utilised. For scavenging the space, *q*, some means must be provided, and a compressor, 53, is shown for the purpose. The compressor has a plunger, 54, mounted on the end of the piston, *l*, and a pipe leads from the compressor to the space, *q*, into which it opens in any convenient position. Thus, the high-pressure cylinders will work as ordinary four-stroke cycle engines, but instead of exhausting into the low-pressure cylinder they will exhaust through valves and openings, with which latter, of course, a suitable exhaust-pipe will communicate. The underside of the low pressure piston also works either as a two-stroke cycle engine or as a four-stroke cycle engine.—May 9th, 1906.

Fig. 4.



15335. 26th July, 1905. A Hydraulic Power Transmission Apparatus. Gottfried L. M. Dörwald and Jules Lecoche, both of 28, Mexfield Road, East Putney, London. This invention relates to a hydraulic power transmission apparatus, by which any portion of the driving power, or any speed from zero to the maximum, can be transmitted There are two figures. Fig. 1 is a vertical section of a portion of a complete apparatus. The driving-shaft, *a*, carries a drum, *b*, having a cover, *c*, at one end, or otherwise made so that access may be had to the interior. On the inside of each end of the drum, *b*, are radial ribs, *d*, the inner edge of each of which being preferably at right angles to the axis of the shaft, *a*, and drum, *b*. Inside the drum, *b*, is a casing, *e*, having six or any other suitable number of sides, the casing being attached to, or formed integrally with, the tubular transmission shaft, *f*, free to turn in a tubular extension, *g*, of the cover, *c*, a stuffing-box, *h*, being provided at the outer end of the extension, *g*. If desired, the inner end of *e* may have a projecting lug, *i*, free to run in a bearing, *j*, in the adjacent inner end of *b*. Attached to each side of the casing, *e*, are two blades, *k*, carried by arms, *l*, having circular stems, *m*, which pass through, so as to easily turn in holes provided for them in the thickness of the material of the casing, *e*. The stems, *m*, are provided with a shoulder, *n*, outside the casing, and with an enlarged base, *o*, inside the casing, which serve to maintain the blades, *k*, in position. Projecting from each enlarged base, *o*, is an eccentrically-placed pin, *p*, and these pins are free to turn in elongated and bushed holes, *q*, in a slide, *r*, which can be moved to and fro within the casing, *e*, by moving in or out a spindle, *s*, passing through the tubular transmission shaft *f*, and actuated by a lever or other means. The extent to which *r* can move within the casing, *e*, is such that when drawn fully in one direction the action of the holes, *q*, on the pins, *p*, will turn the blades, *k*, so that they will stand across the space between the ribs, *d*, at one end of the drum, *b*, and those at the other end, and when pushed as far as possible in the opposite direction the blades, *k*, will be "edge on" in the direction of rotation of the drum, *b*. The blades, *k*, when in position across the drum, *b*, may be so arranged as to be in a plane at an angle to the axis of *b*, or in a plane passing through the axis. In use, any suitable liquid is put into the drum, *b*, and when the drum is rotated centrifugal force will cause the liquid to take a cylindrical shape, and while the blades, *k*, are "edge on" no energy will be conveyed to them, but when they are turned so as to stand to a greater or less extent across the axis of *b*, the liquid being forced through the opening between their inner edges will have its kinetic energy absorbed, and an impulse will be given to the blades, *k*, and the driven shaft, *f* By operating the spindle, *s*, the opening between the inner edges of the blades, *k*, can be varied, the greater the opening the less will be the absorption of the kinetic energy of the rotating liquid, and *vice versa*.—May 9th, 1906.

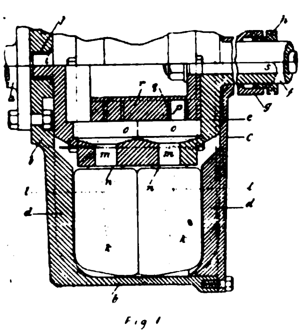


Fig 1

Patent Specifications Published.

Applied for in 1905.

Published May 24th, 1906.

9,815.	C. T. B. SANGSTER. Electric ignition.
12,663.	J. BONN. Speed recorder.
14,944.	N. W. H. SHARPE. Silencers.
16,210.	C. E. HARRISON. Folding seats.
16,585.	F. BERGER. Direction indicator or signal.
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A Record and Review of Applied Automatic Locomotion.

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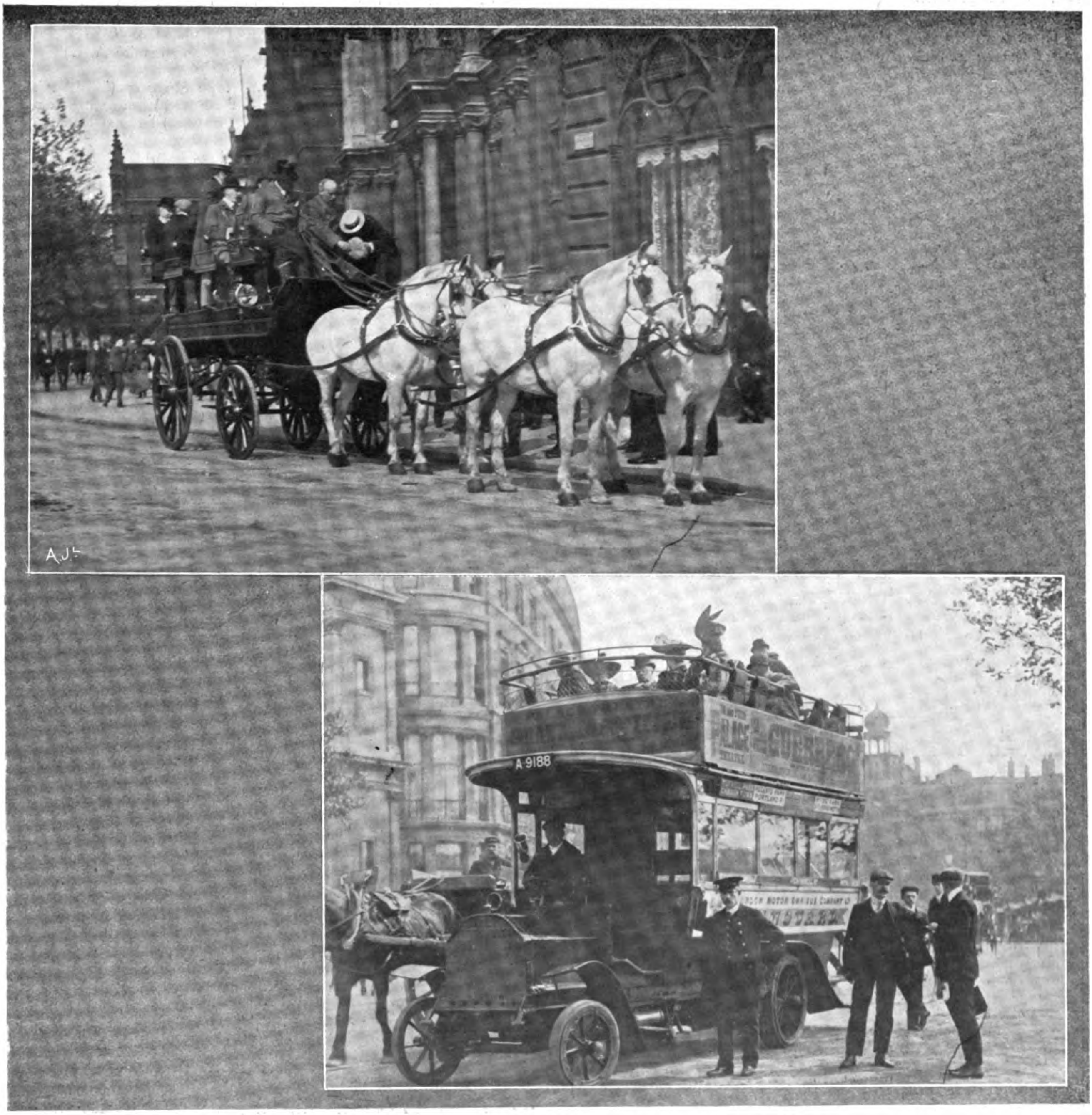

Striking contrasts between the survival of what is ancient but still vigorous and what is new and rapidly developing, are specially characteristic of present day civilisation. Our two pictures, which show a party on a four-in-hand and a well-laden motor 'bus, both *en route* for the Derby, very forcibly illustrate this fact.

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DIARY OF FORTHCOMING EVENTS.

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British Events.

June 9	Hill-Climb (S. Herts A.C.).
June 11–16	Land's End to John O'Groat's (Auto Cycle Club).
June 13–16	Scottish Reliability Trial.
June 13–16	Irish Reliability Trials (Irish A.C.).
June 16	Grindleford Hill Climb (Sheffield A.C.).
June 16	Ragpath Side Hill Climb (N. Eastern A.A.).
June 16	Gymkhana (Essex County A.C.).
June 23	South Harting Hill Climb.
June 23	Du Pré Challenge Cup Hill Climb (Derby A.C.).
June 23	Open Hill Climb (Coventry Motor Club).
June 30	Ranelagh Automobile Gymkhana (Ladies' A.C.).
June 30	Speed Judging Trials (Essex County A.C.).
July	Motor Yacht Club Reliability Trials.
July 2	Hill Climb (Wolverhampton A.C.).
July 5	Gymkhana at Wadsley Bridge (Sheffield A.C.).
July 14	Run for Crippled Children (Sheffield A.C.).
July 14	"Henry Edmunds" Hill Climb.
July 21	Motor Union Meeting (Bath).
July 21	Mablethorpe Sand Races (Lincolnshire A.C.).
July 28	Hill Climb (Derby A.C.).
Aug. 6–18	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8	International Cup (Motor Boats) Eliminating Race.
Aug. 9	International Cup (Motor Boat) Race at Ryde.
Sept. 22	Motor Union Meeting (York).
Sept. 27	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

June 6–13	Herkomer Cup.
June 26–27	Grand Prix (A.C. de F.).
June 28–29	Kiel Motor Boat Races.
July 8	Motor Bicycle International Cup Race (Austria).
July 14–17	Ostende Meeting.
July 15	Mont Cenis Climb (Turin A.C.).
July 26–Aug. 15	Circuit Européen.
Aug. 13	Ardennes Circuit.
Aug. 18	Coupe de Liedekerke (Belgium A.C.).
Aug. 26–Sept. 2	Brescia Week (Italian A.C.).
Sept. 10	Florio Cup Race (Italy).
Sept. 15–16	Mont Ventoux Hill-Climb.
Sept. 20	Lake Major Motor Boat Races.
Oct. 5–14	Leipzig Exhibition.
Oct. 6	Vanderbilt Cup Race.

* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

Felicitations to the King and Queen of Spain.

The King of Spain is such an enthusiastic automobilist, he has done so much to promote the automobile cause in his own kingdom, and is, in all respects, such a progressive and enlightened monarch that every civilised being, and in particular every automobilist, will feel the profoundest thankfulness at the almost miraculous escape of His Majesty and his newly-wedded Queen from the dastardly attempt on their lives, made by the inhuman miscreant who, with a sardonic touch suggestive of the lowest abyss, concealed his explosive in a bouquet of flowers. Both the King and Queen behaved with the calm courage which one would expect from their race and lineage, and it is a noticeable proof of King Alfonso's devotion to the automobile that on the following day he and Queen Victoria mounted one of the royal cars and drove through the streets of Madrid, without any escort, to enquire after those victims of the outrage who had not been as fortunate in escaping from the effects of the explosion as the King and Queen themselves. His enthusiasm for the automobile is only one of the many directions which King Alfonso's generally progressive tendencies assume, but it has the effect of particularly endearing him to votaries of the car in all countries. The selection as prospective victims of two such attractive and innocent personalities by the *rabies* of anarchism may possibly be productive of ultimate good, and will, it is to be hoped, induce the authorities of this country to co-operate with the Governments of the rest of the world in refusing any longer to this particular species of dangerous lunatics the asylum which they are elsewhere denied, and which has enabled them so often to concoct their plots with ease and impunity.

◆ ◆ ◆

Speedometers and Police Traps.

Till police traps cease from troubling (or in other words, till the fines obtained at Petty Sessions cease to be used to diminish local taxation) a reliable speedometer is likely to remain indispensable to the automobilist. This, at any rate, is a conclusion naturally to be drawn from recent magisterial proceedings at places as far apart as Romsey and the South Western Police Court. Before the first of these tribunals, a Mr. T. R. Grey was recently charged with having driven a car through Ampfield at a speed of 28 miles an hour, having, it was alleged by the police, covered the measured 220 yards of the trap in 16 secs. (of course exactly). When stopped, Mr. Grey drew the attention of the policeman to his speedometer, which indicated a speed of less that 20 miles per hour. The case was postponed for one of the magistrates to take a run in the car to test the accuracy of the speedometer, and this he was good enough later in the day to do, accompanied by a policeman with a stop-watch. When the magistrate returned into court, he declared himself convinced of the accuracy of the speedometer, and dismissed the case. A similar incident occurred at the South Western Police Court, where the driver of Mr. Arthur Morris was charged with having travelled at the rate of 29-30 miles per hour. Here a Smith speedometer was on the car, and the magistrates preferred that reliable instrument to the crude police methods of timing. These examples should make converts!

Ne Sutor Ultra Crepidam.

The excellent old motto, that the shoemaker should stick to his last, is one that is often, if not regularly, neglected by shoemakers—and journalists. The results are usually unsatisfactory to all concerned. There have been a considerable number of automobile—particularly motor 'bus—promotions recently, and, as there are sure to be others from time to time in the future, we make these observations with the special object of defining the general attitude which should, we think, be adopted towards questions of the kind by THE AUTOMOTOR JOURNAL. A few weeks ago we felt it to be our duty to warn the public against a particular motor 'bus promotion, and by so doing were, we believe, instrumental in preventing a large number of people from losing their money, who would otherwise in all probability have fallen victims to a considerable extent. Since then there have been several other promotions, some of which, perhaps, hold out a reasonable prospect of returns to investors, but of which others seem to be of "such stuff as dreams are made of"—or soap bubbles, and we have not felt called upon to offer any specific criticism in any individual case. Our reasons have been as follows:—In the case of the company promotion which we condemned, the grounds of our objection were purely *technical*—we might even say physical. It was a physical impossibility that the various operations necessary for the successful running of electric omnibuses could be carried out at the figures suggested on the prospectus, and to demonstrate this damning fact lay strictly within our province. Other companies have since appealed to the public, the *financial* features of which are doubtless open to criticism, and they have been subjected to what is very probably correct criticism in the best financial papers. The financial Press of this country is unquestionably the ablest in Europe, and where the weak points of automobile promotions are essentially financial, and financial only, their *minute details* should, in our opinon, be left in the hands of those who have made such matters their own particular sphere. As an instance in point, we might refer to the Gearless Motor Omnibus Company promotion, which has apparently been open to adverse criticism as regards purely financial details. From the technical point of view, however, we believe the Auto-Mixte system to be quite sound for adoption on heavy motor vehicles, and we consequently contented ourselves with an expression of this opinion, coupled with an accurate description of the system itself, and a careful consideration of its action.

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A Stroke of Official Humour.

The doings of Government Departments, and the mysterious influences which cause them, have for long been relegated by ordinary people to Lord Dundreary's category of things which "no fellah can understand." The most recent enactment of the Thames Conservancy, however, should, we think, be treated, not with argumentative criticism, but with the delicate appreciation suitable to a particularly subtle practical joke. Hitherto the locks and guide-posts on the river have been painted a clear white, so that when the "curfew tolls the knell of parting day," and objects generally become mysterious, when "beauty is at the prow and youth (more or less infatuated) at the helm," the said youth might become duly aware of the above-mentioned locks and posts, and accidents should be avoided. This year, however, the mysterious fiat has gone forth that the locks and guide-posts are to be painted an "invisible grey."

It is almost the precise shade employed for painting battleships when the battle pennant is flying, so that they *cannot be seen* at night, or even in the dusk. We draw the special attention of motor boatists to this last caustic example of official wit and humour, as they are, of course, most likely to be its first and most frequent victims. But we would add that if Mr. W. S. Gilbert or the editor of *Punch* ever find the well-springs of their humour less copious than of yore, they might with advantage cultivate a closer acquaintance with the Thames Conservators, and study the workings of their minds.

◆ ◆ ◆

To Preserve the Hindhead Commons.

Most motorists know and love the road over Hindhead, with its fine stretch of open land and its superb prospect in every direction. Few of them would like to see the heathland at its summit enclosed or walled in, as in this wonderful country, where the rights of the public are practically non-existent, could apparently be quite legally done. They will feel accordingly a sense of gratitude to the Hindhead Commons Preservation Committee for the energetic manner in which they have succeeded in collecting some £3,100 towards the purchase in perpetuity of the beautiful tracts of land in question. The total sum needed is, however, £3,750, so that £650 is still required. It would be a great pity if the project should fall through for want of this relatively small additional sum, and motorists, who after all are the chief enjoyers, and should accordingly be amongst the principal guardians of our scenery, may, we hope, be entrusted with making up the deficit. This apparently is the view taken by some of the leading members of the Automobile Club, and contributions have been made to the fund by the Hon. Arthur Stanley, M.P., chairman of the club, and by several other influential members. We understand that the secretary of the Automobile Club has announced his willingness to accept and forward to the proper quarter further subscriptions.

◆ ◆ ◆

Indifferent Counsels for Councillors.

The annual meeting of the County Councils Association may be relied on to produce a certain amount of effect in the local administration, particularly of country districts, and more especially the management of the police, for county councillors who attend this meeting naturally compare notes with one another, and are very considerably influenced by the speeches from prominent members which are addressed to them. It is, therefore, with a good deal of regret that we note the line adopted by Sir John Hibbert, the chairman of the meeting, in the speech which he delivered at the Middlesex Guildhall one day last week. "Motors and motorists have come to stay," he admitted; but evidently he would have much preferred if they went instead of stayed, as he immediately added: "We must make the best of them," and proceeded to advocate that the yearly payment for a licence was not sufficient, but that there should be a substantial annual payment by the owners. Sir John seems to have forgotten altogether that the Inland Revenue looks very carefully after that, or if he has not forgotten it, then we must presume that he suggests that motorists should be compelled to pay further sums, either as taxation or licences, over and above those that they at present contribute. It is the same old stupid idea that has done so much to stop progress—the anxiety to kill the goose that lays the golden eggs so as to get them all at once. From a man in Sir John Hibbert's influential position one would have expected a wider, and what we might perhaps call a more statesmanlike view of things, and it is not likely to be generally beneficial that the county councillors who had the opportunity of drinking in his eloquence shall go back to their various localities impressed by the fact that this is the attitude of their chairman.

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The Story of a Great Revenge.

THE following is the legend of the origin of the police traps on the Salisbury Road, the victims of which have subsequently had to "hand-over" such huge sums during the past year to the relief of the local rates in the form of fines. About a year or so ago a local magistrate was driving along this particular road one day with a young and imperfectly broken-in horse. Scarcely had he emerged from a side road into the main road, taking the direction of Salisbury, when he was confronted by a motor car approaching from the opposite direction. The horse, with the intelligence and promptitude characteristic of his race, instantaneously pirouetted round on his hind legs and dashed off in the opposite direction to that which the learned magistrate desired to take—the speed of the unruly quadruped being by no means moderated by the fact that an irate and leather-lunged Justice of the Peace was loudly calling upon him to stop. The horse, however, was at last placated, and another attempt to approach Salisbury was made, when, heigh presto! another motor car came along. This time the horse curveted and bolted in the opposite direction, carrying at high speed nearer and nearer to the wished-for goal the magistrate, who smiled to himself and thought that as a means for inducing unruly horses to exert themselves effectively there were worse things than a fright by a motor car, if only it were exercised in the proper direction. But alas and alack, scarcely had the luminary of the Bench come to this conclusion, when a third motor car appeared approaching from the direction of Salisbury, and once more the magistrate's ungovernable source of energy curveted on its hind legs and retraced its frantic steps to the spot from which it had started. Several times was this phenomenon repeated, and the Justice of the Peace oscillated to and fro along the Salisbury Road like an alternating current of slow periodicity, driven alternately to and from his objective by the alternate approach from opposite directions of various motor cars, the magistrate at the end of his experiences being little nearer Salisbury that when he started. He was ultimately compelled to take home his horse and trap and trudge two miles afoot "deeply devising evils," as the old poem says of a certain hero. After this, the magistrate set himself to make the Salisbury Road unpleasant for automobilists and incidentally profitable to the ratepayers. So far he has succeeded admirably. A free competition is open to our readers as to what the name of the magistrate referred to above may be.

Motor Car Commission Report.

UPON the authority of Mr. Burns, the report of the Royal Commission on Motor Cars may be expected to be presented to Parliament before the end of the session, when an opportunity will be afforded of discussing it before the Act is renewed.

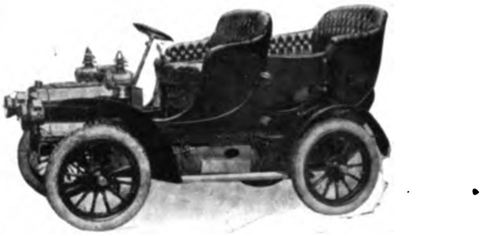
How to Recognise the Cars of To-day.

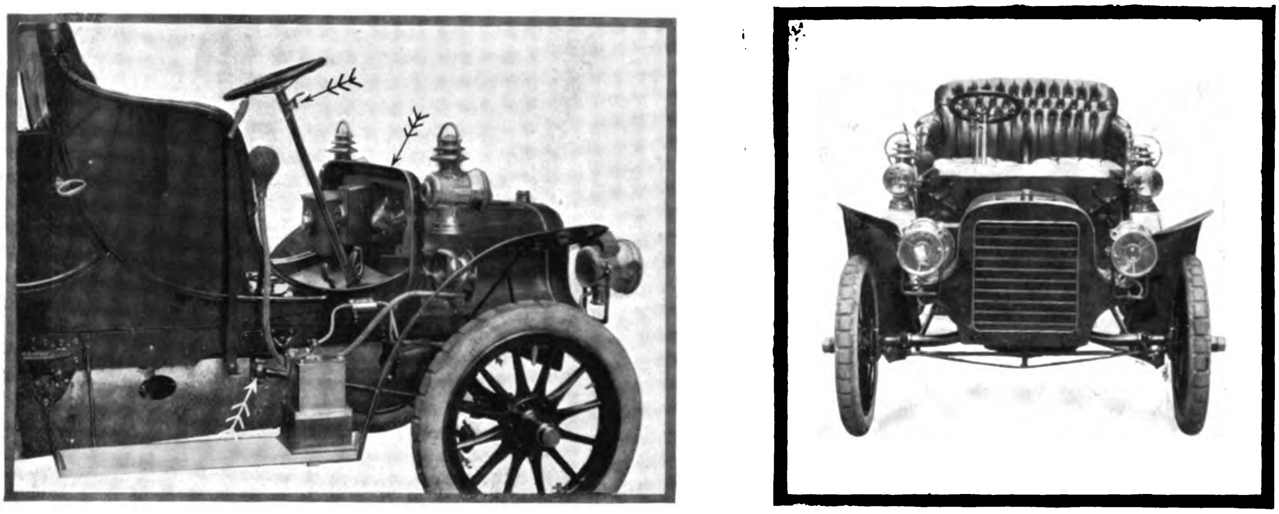
(No. 35.)

The Cadillac

(AMERICAN)

9 H.P.





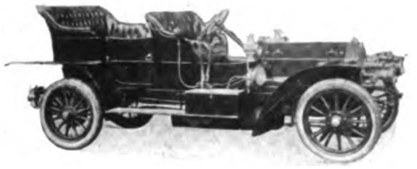
Above the FRONT AXLE, the main frame is supported by a TRANSVERSE SPRING, while, between the axle and the frame are RADIUS RODS which have ball-socket attachments. On the latest models both ignition and throttle levers are below the steering wheel, and another feature of the 1906 type is the CURVED DASH.

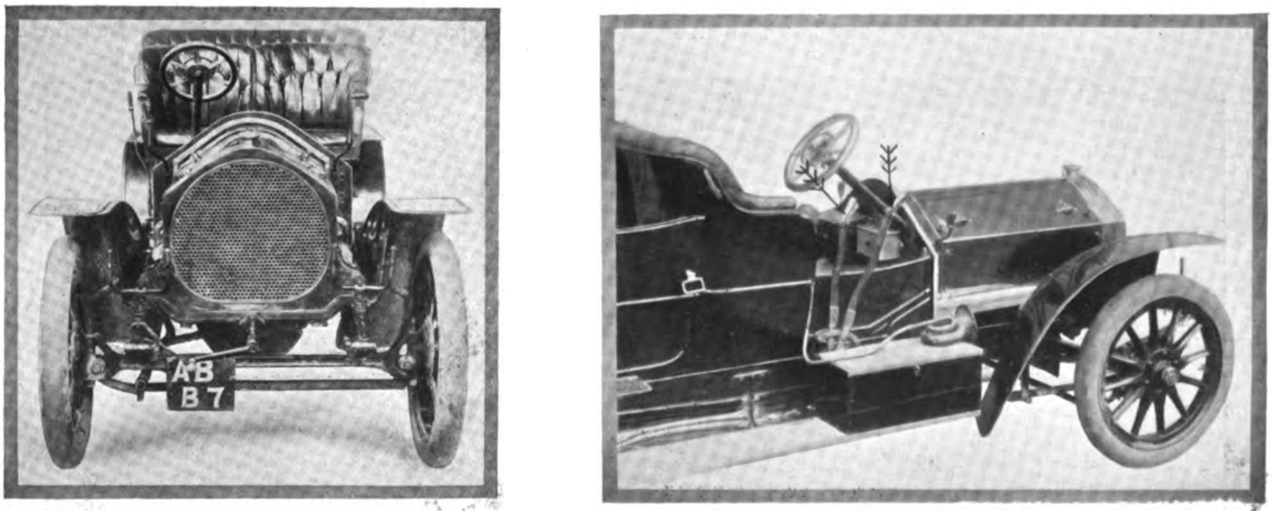
(No. 36.)

The Enfield

(BRITISH)

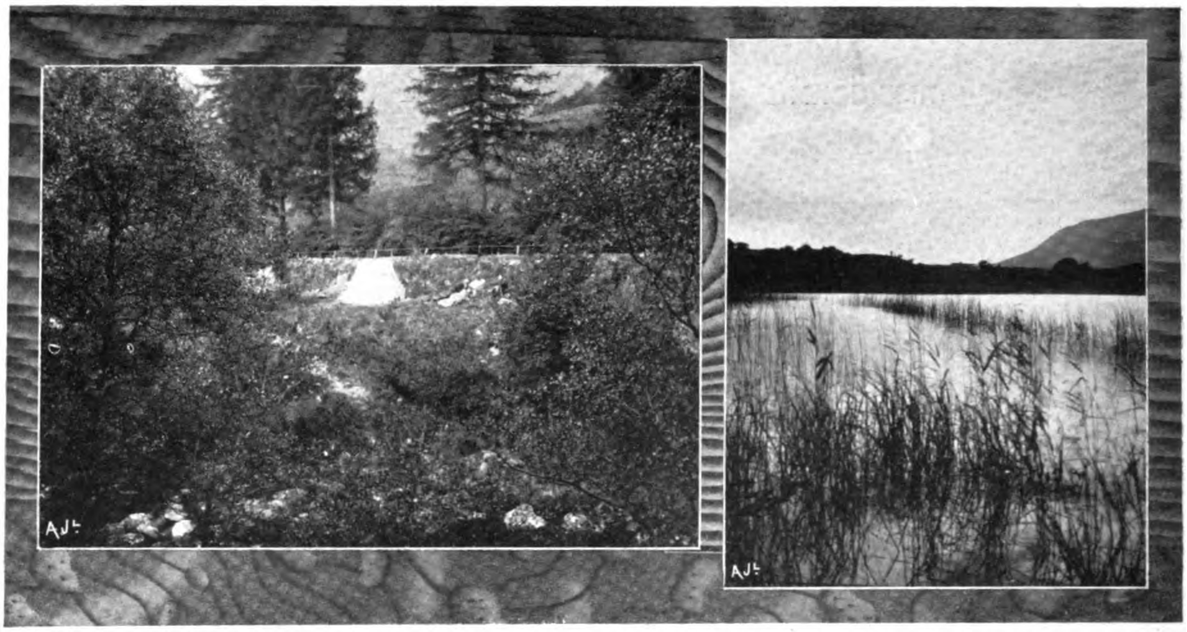
10-12, 15-20 & 25-30 H.P.





The RADIATOR on these cars is particularly noticeable on account of its shape and of the unusually large size of its honeycomb tubes. Other distinctive points on the car are the change-speed and brake levers, and the arrangement of the STEERING COLUMN which passes through the dash.

THE PICTURESQUE SIDE OF MOTORING IN IRELAND.*



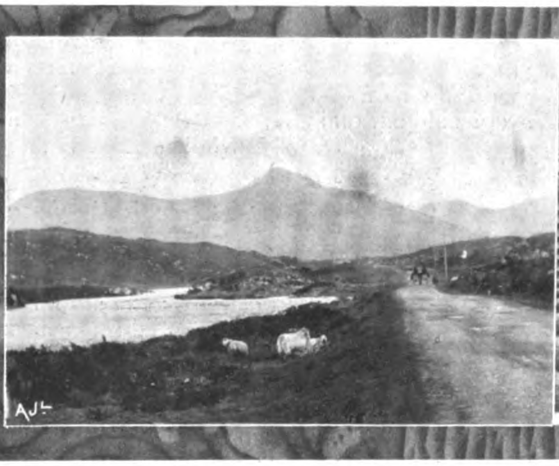
A motor camp in Glenmalure, Co. Wicklow. A reed-bordered pool in the boglands.

THE PICTURESQUE SIDE OF MOTORING IN IRELAND.

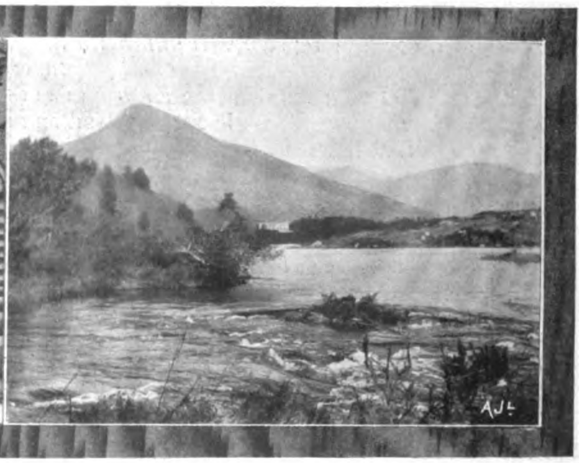
THE Saxon tourist visiting Ireland for the first time must arrive prepared for many surprises, a few disillusionments, and a variety of experiences, pleasant or otherwise, according to the spirit in which they are met. It is essentially a country of moods—in weather, scenery and people. But humour these moods, laugh with the gay, sigh with the mournful, and you will get a happy grip on things Irish. For the dividing line between tears and laughter, pathos and insinuating humour is so subtle that one follows the other with true Celtic quickness.

A situation may arise in which those concerned are plunged into the very depths of woe. But not for long. A quick-minded peasant seizes on the smallest element of humour, and the tension is relieved by a flash of ready wit, and smiles, never far away, return. So with the weather. Grey skies overhang a desolate landscape and blot out the mountains, and fine rain falling dismally damps the spirits of the most ardent. But lo! in half an hour the sun is shining out with added brilliance, the whole world seems a-glisten, and the clouds melt away to the horizon as if in very shame.

With the exception of the roads (and of these we live in hope), the Green Isle forms an ideal touring ground. But let your tour be a dilatory one; put away modern unrest, and absorb just enough of the Irish character to " be aisy." A leisurely saunter through the country will amply repay you. So let the high-horse-powered



Ballynahinch River, Connemara.



Ballinahinch Castle, Benlettery Mountain in background.

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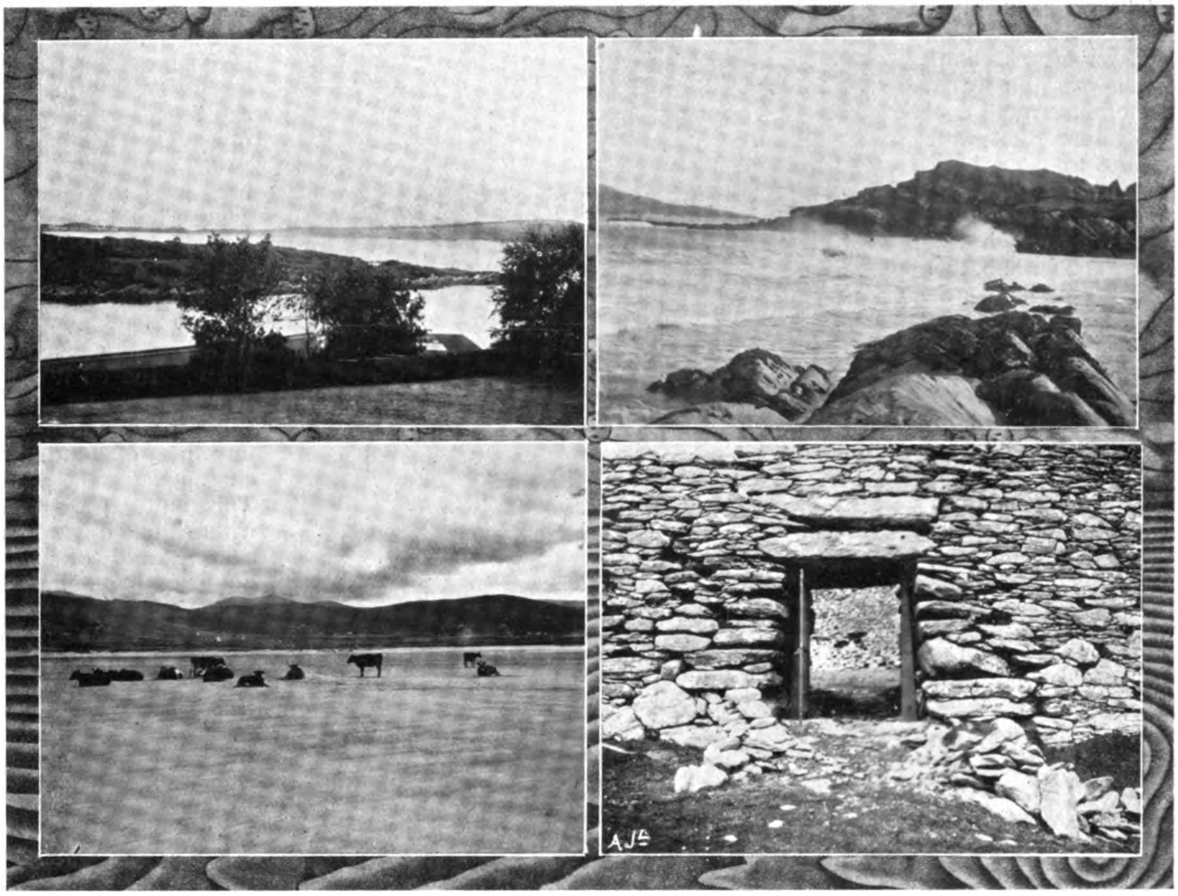
* The photographs illustrating this article are by Mr. R. J. Mecredy, Mr. J. White, Mr. T. Mason, and Mr. Louis Meldon.



Parknasilla, Co. Kerry. A sheltered bay near Derrynane, Co. Kerry.

Smerwick, Co. Kerry. Entrance to pre-historic fort near Caherdaniel, Co. Kerry.

THE PICTURESQUE SIDE OF MOTORING IN IRELAND.

monster eat off his head in impatient idleness in the garage, and board a modest four-seater, with only sufficient power to top the Kerry Passes. If you are a fisherman, put up a rod with your baggage, and for choice let June or September be your holiday months, for in these the weather god wears his most benignant smile, and the country, too, will be seen at its best. The coast scenery is magnificent, finer, perhaps, than anything in the British Isles. North, south, east, and west supply every variety. Bold rocky headlands; islands where live a primitive people whose language and customs have not changed with the centuries; wide bays where the Atlantic breakers roll in with a grandeur befitting a mighty ocean, and long inland fiords with the vegetation growing in tropical profusion down to the water's edge, and only the seaweed on the rocks to give evidence that the limpid blue waters are fed from the sea which glitters on the horizon. Inland are moun-

Glendalough, Co. Wicklow. Lough Inagh, Connemara.

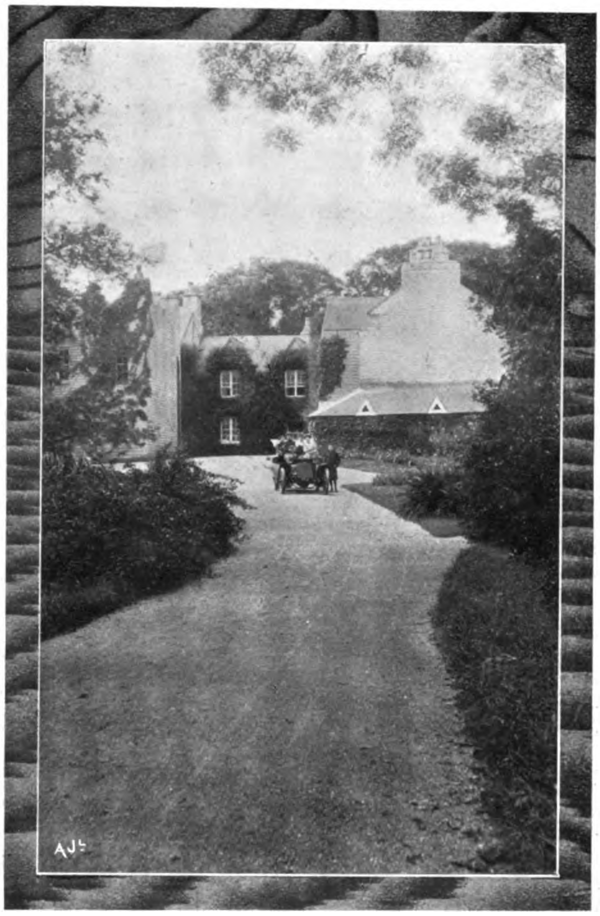
THE PICTURESQUE SIDE OF MOTORING IN IRELAND.

tains, lakes, ancient ruins to delight the archæologist, and the pastoral beauties of the river valleys. Surely no more charming route could be found than that which follows the windings of the lordly Shannon, with Killaloe as one's objective, and the wide waters of Lough Derg beyond. Then again, there is Wicklow—"The Garden of Ireland"—with such well-known scenic gems as Glendalough, the Vales of Avoca and Clara, and innumerable lovely glades set in its midst.

And the Bog lands! But you must first learn to know and love Ireland before you can experience the true glamour of an Irish bog. There it lies, a vast expanse of flat country bordered by blue hills, uninteresting and monotonous to the casual eye. But draw closer, study it under ever-varying conditions, and those wide stretches will exercise a mystic charm, and fill your being with a sense of artistic completeness.

There are no striking contrasts of colour save where a patch of vivid green hangs out a warning signal against the treacherous morass. Grey reeds, sage-green myrtle, brown peat and purple heather cluster and mingle in one harmonious whole. But note the rich shadows thrown by yonder stack of turf. See how the sunlight sets the myriad pools aglow until they shine like jewels—amethyst, amber and sapphire—in a sombre setting.

Here and there white mist wraiths trail upwards despite the sun's brilliance, and a mysterious silence broods over the scene, warm and heavy with the scent of bog myrtle, until a little breeze is born in the firwoods far away on the distant slopes, and suddenly the boglands quiver into life. It is a gay, youthful little breeze; it banishes the mist, sets the bog cotton waving in a white shimmer, and wantonly ruffles the reflections from the surface of the water. A lark springs up from a heathery knoll almost at your feet, and rises into the blue above with a burst of silver melody.



THE PICTURESQUE SIDE OF MOTORING IN IRELAND.—Dan O'Connell's residence at Derrynane.

What wonder that the peasants born and bred in such surroundings are full of fanciful superstitions! They can tell you strange stories of good and evil wrought by "the little people," and how hard it is to appease their anger should one chance to offend them. How they can spoil a crop of potatoes or bewitch a stolid old country farmer, or lay a spell on the good wife's churn. Indeed, it is a fairly common custom with the country folk to lay aside a tiny pat of butter, when churning, for the "fairies." This butter pat is in the nature of a propitiative offering, and ensures that the churning will turn out successfully.

But let us away to the west. The roads here, especially in Connemara, are amongst the best which Ireland can show, and in the region guarded by the Twelve Pins, there is a wealth of scenic beauty. Here is Kylemore Pass, with its lake and the fairy-like pile of Kylemore Castle standing, a white gem, on its wooded slopes.

Here, too, is Ballinahinch Lake, where standing on the small bridge through which the river runs, one gazes on one of the most beautiful views in the district. The placid waters of the lake reflect Benlettery's rugged slopes, and Ballinahinch Castle, formerly the home of the Martins, an old Connemara family, stands framed in sloping green woods on the farther shore. The remains of an old castle, built in the sixteenth century—some say as a prison for the family's enemies—peep from the trees on an island in the foreground, and the whole scene is one to linger over. Salruck, Leenane, Killary Bay, Delphi, all these lie in fairly close proximity, and thence we may wander along the rugged coast, where the tiny villages seem to belong to another country. The acrid odour of burning kelp comes up from the shore, where men, women, and children are engaged in gathering seaweed for the purpose of making iodine.

(To be concluded.)

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Pour Encourager les Autres.

WE are glad that an example has been made of the cantankerous kind of brute who turns his trap across the road with the intention of obstructing automobilists. At Uttoxeter recently, Herbert Smith, a fishmonger, in this way attempted to interfere with the free use of the highway, when Mr. R. D. Hodgson's car was approaching, and his driver had to turn it so suddenly that he ran into a hedge, and Mr. Hodgson was thrown out and seriously injured. The fishmonger was fined £1 for the obstruction, and £5 for causing the accident. We trust that this may indicate that magistrates intend in future to take a more severe line with these nuisances of the highroad.

Chalk not Permissible.

A GENTLEMAN who had no proper number on his car, but had endeavoured to rectify the deficiency with the use of a piece of chalk, was recently fined by the Chertsey magistrates. We do not see that he could expect anything else, as merely to chalk your number on your car is well known to be illegal.

THE ROCHET-SCHNEIDER CARS.

There was a time when the Rochet-Schneider Company very wisely confined their attentions to making only one model, and in cementing their reputation by the attention which they gave to making it satisfactory. It is as the result of this kind of experience that they are confident in placing as many as six different sizes on the market for the current year. Lyons has cause to be proud of the factory manufacturing these vehicles, which have for long been popular in all countries, and are even being manufactured under licence in Switzerland, Italy, and Belgium, by independent firms—a still further guarantee of the esteem in which they are generally held. In this country the cars are in the hands of Messrs. Donne and Willans.

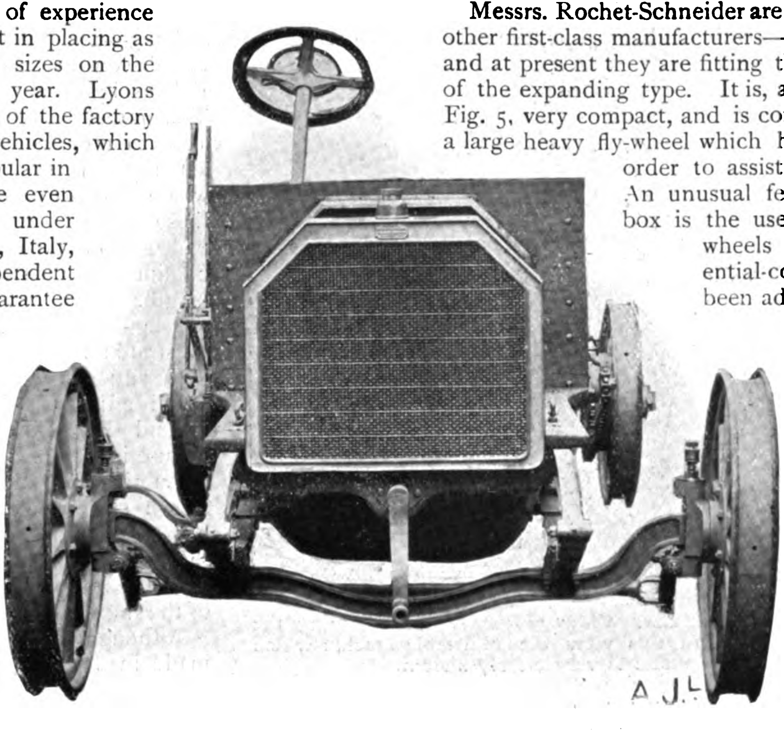

Fig. 1.—The Rochet-Schneider Car. Front view showing the peculiar radiator, which is composed of flat tubes, having hollow gills.

The models now made range in size from 18 to 70-h.p., and all are chain-driven cars with the exception of the smallest. In detail, Rochet-Schneider cars are not now remarkable for any startling innovations, but it must be remembered that this firm have never been conservative as regards departures from standard practice, and, as a result, they were among the first to adopt improvements which have since become generally employed. They were, for instance, among the first firms to fit two independent brakes on the differential countershaft, and the present models are thus provided, and now have a ratchet-sprag in addition. Three-point suspension at the rear of the frame is one of the latest changes, and it will be noticed, on referring to Fig. 5, that the chain-sprocket bracket has been used as an attachment for the front shackles of the side-springs, and for the radius-rods, instead of providing separate brackets for these various members.

Messrs. Rochet-Schneider are advocates—like many other first-class manufacturers—of the metallic clutch, and at present they are fitting their cars with clutches of the expanding type. It is, as will be evident from Fig. 5, very compact, and is contained in the boss of a large heavy fly-wheel which has fan-blade arms in order to assist the cooling system. An unusual feature about the gear-box is the use of equal-sized bevel-wheels for driving the differential-countershaft; this has been adopted because the firm consider that it gives a more efficient transmission and reduces the end thrusts on the shafts. It is a standard feature on all the cars, and as a result, the gear ratio is entirely decided by the size of the chain-sprocket, which explains why those on the less powerful vehicles are rather small. A direct drive to the differential-countershaft is provided on the fourth speed, and the reverse is introduced by a backward motion of the sliding-member for the lower speeds. This enables the gears to be operated, on the Mercedes principle, by only two sliding rods instead of three, as is more usual on cars which have four speeds and a reverse. Ball-bearings are provided on both shafts in the gear-box as well as on the road-wheels. Illustrations of the engine are given in Figs. 3 and 4, from which it will be noticed that the cylinders are cast in pairs and have their valves on opposite sides. A governor is provided for the purpose of regulating the engine-speed by acting upon the throttle, but otherwise the power is controlled entirely from the hand-lever above the steering-wheel. This hand-lever operates a sliding,

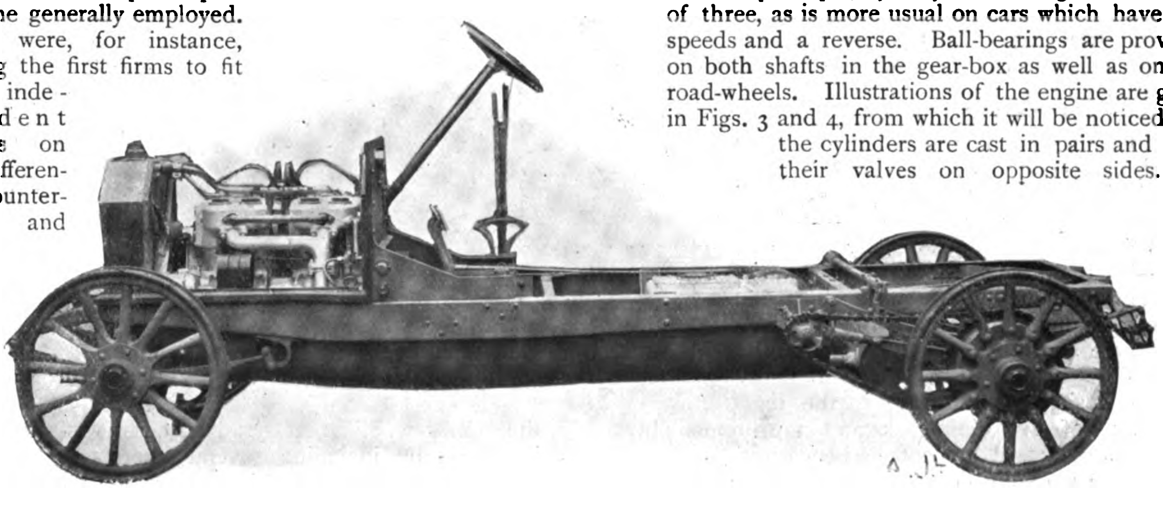

Fig. 2.—The Rochet-Schneider Car. Side view of the chassis, showing the general arrangement of the mechanism, and the transverse spring which supports the rear part of the frame.

conical-shaped sleeve in the mixing-chamber, but when starting, the main air inlet-ports can be partially closed by means of the lever, D, on the dash in order to increase the richness of the mixture. For running quite light, there is a by-pass through the throttle-valve which admits sufficient mixture for this purpose, even although the throttle itself is closed. Instead of drawing warm air from the vicinity of the exhaust-pipe, the mixing-chamber is water-jacketed. Petrol is fed direct from a large tank at the back of the frame by exhaust pressure, and a hand-pump is provided for obtaining the initial pressure when starting. This pump is ingeniously arranged at the side of the footboard (Fig. 5), where it is convenient and not unsightly. Immediately beneath the pump-handle, A, is a valve, A^1, controlling the communication between the pump and the petrol tank. This little detail of arrangement is typical of the attention which the Rochet-Schneider firm give to such matters. Another example of this is the petrol filter, A^2, which is of a useful size, and is thoughtfully provided with a tap, in an accessible position, for the purpose of draining off any sediment, and—what is often as much to the point—for allowing a supply of petrol to be taken from the main tank if required. How many cars there are from which it is practically impossible to collect a drop of petrol without losing a lot, owing to the inaccessibility of the drain-cock and the impossibility of placing any fair-sized receptacle beneath it.

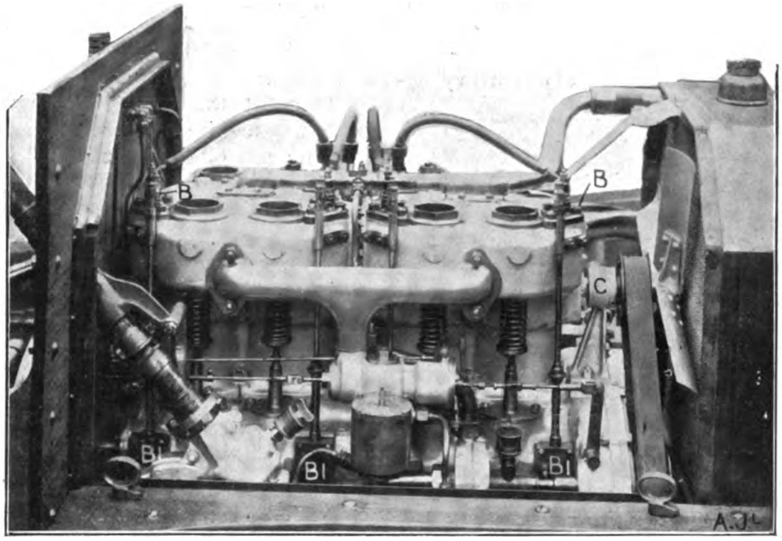

Fig. 3.—The Rochet-Schneider Car. View of the engine, showing the carburettor and the igniters. In this view the adjustable bracket which carries the fan spindle is very clearly shown.

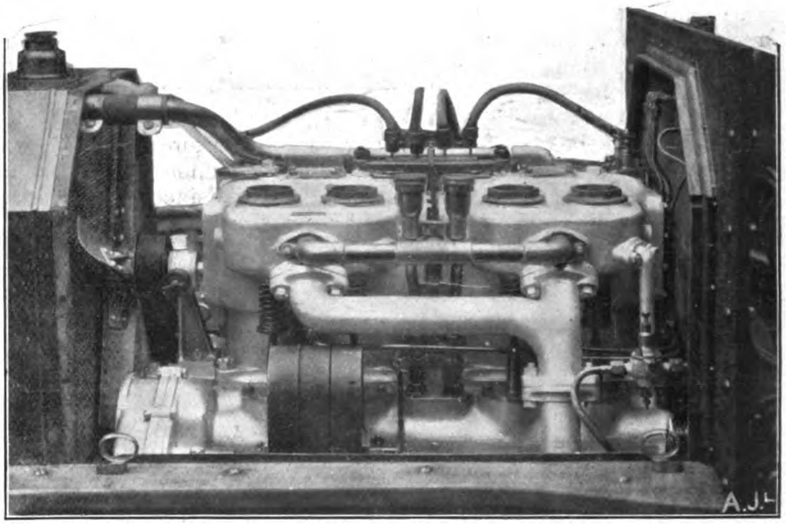

Fig. 4.—The Rochet-Schneider Car. View of the engine, showing the position of the low-tension magneto. Above the cylinders will be noticed the neat plug fitting, from which the wires are led to the igniters.

Low-tension ignition is still used on these cars, but the igniters are now placed on top of the inlet-valve chambers alongside the inspection covers, which enables the valves to be inspected without disturbing the ignition mechanism, as was inevitable when the igniter and the inspection cover formed one fitting. These igniters, B (Fig. 3), are operated by vertical rock-shafts from face cams, and a timing mechanism, B^1, is provided which can be controlled from a hand lever above the steering-wheel. On cars of 30-h.p. and upwards the igniters are enclosed in a separate pocket which freely communicates with the combustion-chamber, this arrangement keeping the contacts cleaner should there be an excess of lubricating oil in the cylinders.

Circulation of the cooling water is effected in the usual way by a pump—which is visible alongside the carburettor in Fig. 3—and the radiator is assisted by a belt-driven fan immediately behind it as well as by the fan-blades in the fly-wheel. This radiator (Fig. 1) has a similar appearance to those of the honeycomb type, but actually is formed by numerous flat tubes which have hollow gills. At intervals, these tubes are joined by a horizontal passage so that the water is not necessarily confined to the same tube throughout its length. Attention may also be drawn to the fan-bracket, C, which is most clearly illustrated in Fig. 4. It is a particularly neat and substantial fitting and it is rendered adjustable by an eccentric sleeve around the fan-spindle. Another striking feature is the great width of the fan-belt.

Lubrication takes place on the usual splash system, and oil is fed under exhaust pressure to the crank-chamber, through the sight-feed fitting on the dash, from the reservoir mounted against the side of the frame.

Although the Rochet-Schneider cars are made in such a large range of powers, the number of different standard chassis is still further increased by including several alternative lengths of wheel base. Thus the 18-h.p. car, which has a live axle, is supplied in three different lengths, as is the 40-h.p. chain-driven car. No less than four alternative chassis are available with the 30-h.p. engine, while two can be supplied with engines of 70 h.p. The 24 and 35-h.p. models are the only cars which have but one standard length of chassis each. With the exception of the 24 and 35-h.p. models, all the chassis have a transverse spring as described above, but on these two cars it is not fitted. Three speeds instead of four are provided on the 18-h.p. car.

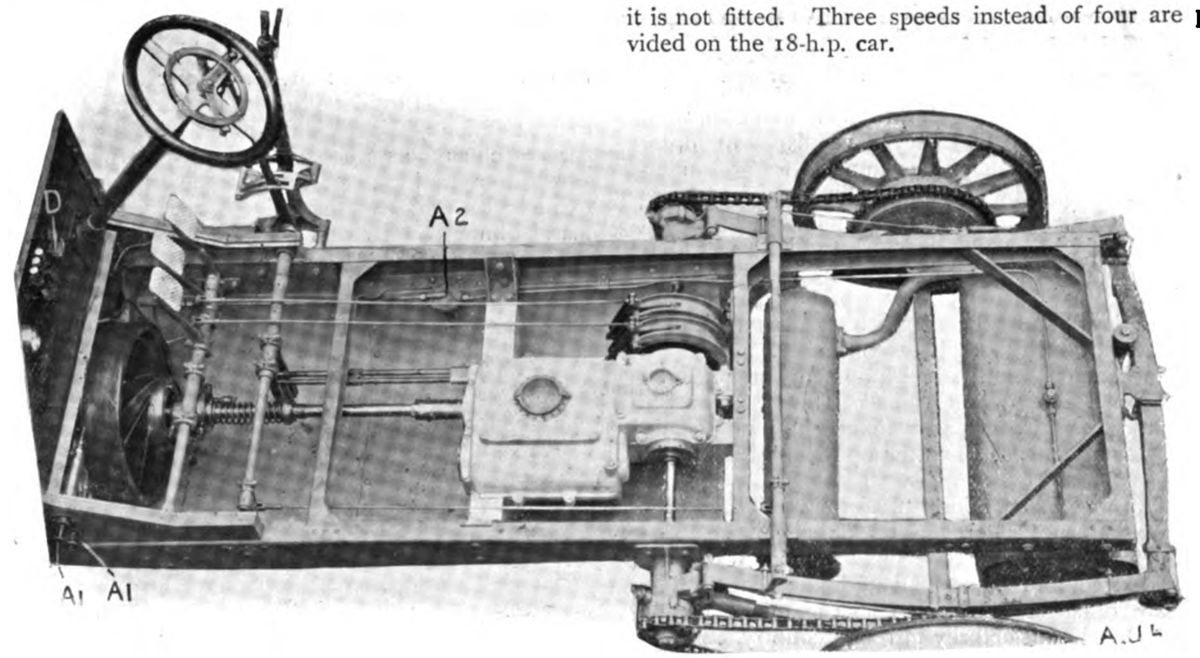

Fig. 5.—The Rochet-Schneider Car. View of the chassis from above, showing the arrangement of the two independent foot brakes. Prominent in this illustration are the hand-pump, A, and the petrol filter, A^2, both of which are placed in unusually convenient positions.

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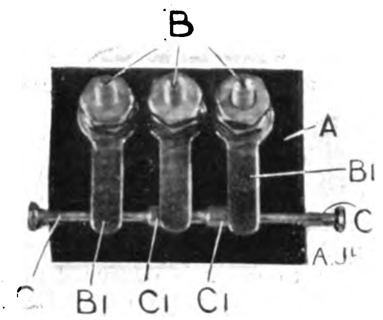
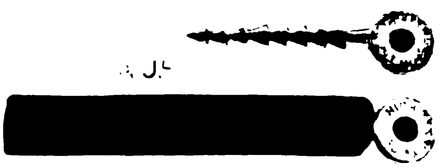
TWO NEAT ELECTRICAL FITTINGS.



A very neat, and at the same time very simple, two-way switch has been placed on the market by the High-Tension Company. This consists of a small block of ebonite, A, carrying three terminals, B, to each of which is attached a spring clip, B^1. In a groove cut in the ebonite under the ends of the clips slides a rod, which has two enlarged sections near the centre. These portions of the rod make contact with the clips, and are sufficiently wide apart to bridge across any two clips which are adjacent.



In the same illustration is another neat fitting made by the same firm. It consists of a terminal for attaching to the ends of high-tension wires, in order to more easily connect them to the ignition plugs or to other terminals. This terminal is stamped from sheet brass, and has a barbed spike for inserting into the cable end. It is chiefly suitable for high-tension wires, however, as the insulation on most low-tension cables would hardly afford a sufficiently good grip.

THE "RUB-METAL" NON-SKID.

Among the numerous devices for preventing cars from skidding, the steel studded band has, perhaps, become the most popular. Although the majority of manufacturers use a leather foundation for their metal projections, some of them, including the New Motor and General Rubber Company, prefer to fasten their steel studs directly into a rubber tread. Our illustration shows a section of one of the "Rub-Metal" non-skid tyres, as manufactured by this company. The tread is constructed of specially prepared rubber and Egyptian cotton fabric, and a peculiarity of the steel studs is that they have hollow stems. This enables the clinch to have six tongues instead of only two, as in the case of the ordinary bifurcated rivet. It is claimed by the makers that this method of fastening gives much greater security, and another point which is urged in connection with the "Rub-Metal" band is that it can be properly vulcanized on to the tyre itself by the steam process, instead of being attached by the aid of acids when cold.

Motor 'Bus Traffic "Returns."

As a sign of the times, in the traffic returns regularly published the receipts from passenger traffic by the "Vanguard" motor 'buses are now included. For the week ending May 19th, the figures show an increase over 1905 of £1,961 for the week.

PORTUGUESE GOVERNMENT BUYS BRITISH MOTOR VEHICLES.

STEAM motor wagons and ambulances being required by the Portuguese Government, we are pleased to be able to announce that they have placed the order in this country, although it was competed for, we understand, by many Continental firms. These vehicles were originally intended for use in a punitive expedition organised by the Portuguese in connection with their possessions in West Africa.

The work was carried out with remarkable celerity (thirty-nine days), and reflects much credit on the contractors and all the British labour concerned.

The mechanical transport equipment supplied by Messrs. John I. Thornycroft and Co., Limited, consists of four 5-ton steam wagons with eight 3-ton trailers and a 30-cwt. steam van specially fitted up for the use of staff officers.

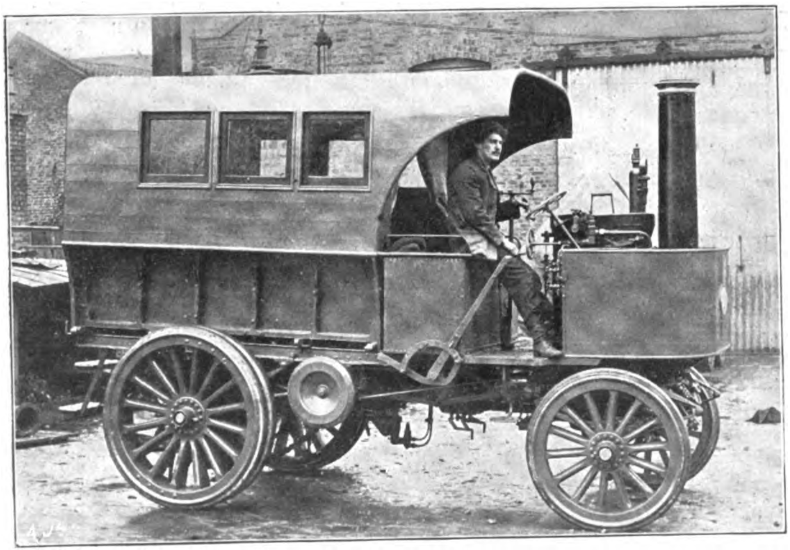
The 5-ton wagons have lorry platform bodies, and are of the well-known "Thornycroft" Colonial type, with vertical central-fired water-tube boilers, adapted to burn wood, if desired, and compound 45-h.p. engines. The wagons are of specially strong construction, to enable them to be used satisfactorily in rough country, and the transmission gear is all enclosed.

Two of the wagons have interchangeable ambulance bodies, the largest ever built. These bodies carry twelve men each, there being eight stretcher beds in each ambulance.

Owing to the rough country to be traversed, patent automatic weight-adjusting, spring-supporting gear for the stretchers was invented and fitted by Messrs. Carter, who built the ambulance bodies. This invention should enable the motor ambulance to be very largely used in the near future, and it is, therefore, of great interest.

The special light steam van shown in our photograph is comfortably fitted up for use by day or night. The wheels are fitted with solid rubber tyres, and the wagon is capable of a speed of about fifteen miles an hour on the level.

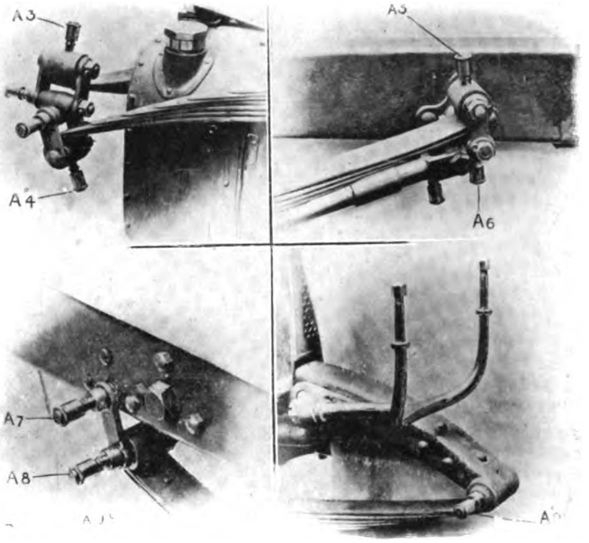
The boiler is of the "Thornycroft" vertical water-tube type, and the engine is a compound one developing about 25 h.p.



A light steam Thornycroft van which has just been completed for the Portuguese Government in connection with a military expedition in Portuguese possessions in West Africa.

SUSPENSION AND LUBRICATION.

THERE are no more indefatigable searchers after improvements than Mr. M. S. Napier and Mr. S. F. Edge, and the latest detail of the Napier cars to receive their attention is the efficient lubrication of minor moving parts, such as the spring shackles. As the photographs, which we reproduce, clearly show, the subject has been treated with that characteristic thoroughness which all matters in the Napier works receive. There are now no less than eighteen little grease cups fitted to the various spring joints. Their positions are indicated by the photographs, and it will be noticed that each universal coupling used as a shackle for the transverse spring has as many as four greasers to itself. Two lubricate the front ends of each of the rear side-springs, and there are two for the shackled end of each front spring; the forward ends of the front springs, however, only have one greaser each, because they are hinged instead of shackled.



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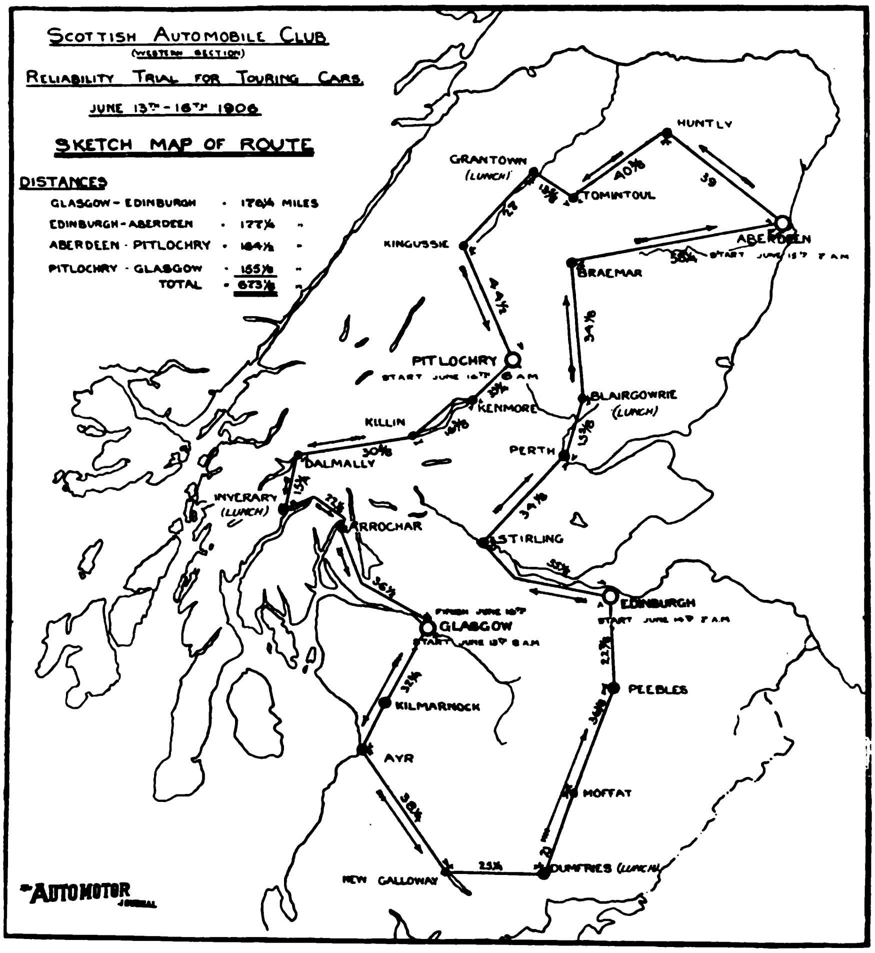
Motoring in Australia.

SOME account of the pleasures of motoring, even in Australia, where the roads are vastly inferior to ours, is conveyed in a letter received recently from Mr. L. J. Davies, of Sydney, N.S.W., by Messrs. Humber Ltd. "It may interest you," he writes, "to learn that I have just had a run of about 350 miles in my 16–20-h.p. Beeston-Humber, with five up, in our Blue Mountain District. While the roads are good for a new country, they would be considered very bad if met with in England. From Penrith to Blackheath, a distance of about 35 miles, we rose to about 3,600 feet. I went through to the Jenolan Caves and back again to Sydney without the slightest trouble or hitch with the car, the engine working splendidly throughout. My Humber has now done about 3,500 miles, she looks in every part as good as new. I had a look at the gear wheels this week, and they do not show the slightest signs of wear."

RACES, RECORDS, AND TRIALS.

SCOTTISH RELIABILITY TRIALS.

Almost before the effects of the Whitsuntide holidays have worn off, the Scottish Reliability Trials will have commenced. Those who took part in them last year hardly realised what a treat was in store, but the long and representative entry list this year is striking evidence of the popularity to which they immediately attained, and of the fact that the motor industry at large does not mean to lose the advantages which accrue from taking part in this rigorous yet delightful contest. We have already published very full details and particulars as to the arrangements, but a brief *résumé* will no doubt be found useful by our readers, who are likely to take more than a passing interest in the forthcoming event.



The trials commence on the 13th of June, and are held over each of the succeeding days to the end of that week. An important variation between this and the former event which took place last year, is that an absolute non-stop performance is not now essential to eligibility for a medal award; but the route this year will, it is said, provide an even still severer test of the hill-climbing powers and general reliability of the competing vehicles, than did that which was previously followed. There will be maximum and minimum times between the various towns passed through, and this schedule will be drawn with a due regard to the nature of the roads, and the legal limit of speed. No less than 84 cars have been entered, and it is anticipated that the majority of these will actually turn up at the start. They are divided into four classes, according to the price of the chassis, but in the table which we now publish, in order to give intending purchasers the fullest details possible, the price of the complete car only is given. In each class, only one car of any specific make, type, and horse-power has been admitted, so that the total number of vehicles is thereby reduced to a minimum. The long entry list is therefore evidence, in itself, of the representative character of the event.

The system of marking for reliability is exceedingly simple, for every minute or part of a minute during which the vehicle is at rest—except for compulsory stops—will cause it to lose one mark out of the maximum number allotted for the run. If the car arrives later than the maximum time allowed for any stage, the time so lost will be reckoned as a stop. On a similar basis marks will also be deducted for arrival prior to the expiration of the minimum time. Tyre troubles, which are always the *bête noire* of such events as these, have been dealt with by allowing a total of one hour during the whole trial in which to make any tyre repairs that may be necessary, and if this time is exceeded it will be reckoned as an involuntary stop, and marks will be deducted accordingly.

Vehicles will start from Glasgow on June 13th, at 7 o'clock in the morning, leaving according to their official number, and will proceed *viâ* Ayr, Dalry, Dumfries, Moffat, and Peebles to Edinburgh, which city they are expected to reach at ten minutes past five in the evening. On the second day they leave Edinburgh at the same time in the morning, and pass through Stirling, Perth, Blairgowrie, and Braemar on their way to Aberdeen. From Aberdeen, the run on the third day is to Pitlochry, taking *en route* the towns of Huntly, Tomintoul, Grantown-on-Spey, and Kingussie. The last day's run brings the cars back again to Glasgow, *viâ* Killin, Inveraray, and Arrochar. The whole route passes through some of the best known places, and the scenery at every point is of a nature which will cause even those who think they know their Scotland well, to be glad that they have had such an opportunity for observing its picturesqueness from the seat of a motor car. There will be a hill climb on the first day between Moffat and Peebles; the actual site is known as Birkhill, and is a little over 10 miles from Moffat. The hill is 1,745 yards long, and has an average gradient of 1 in 17 with a maximum of 1 in 14. On the second day the famous Devil's Elbow will be encountered in the Cairnwell Hill Climb. This hill is 3,678 ft. long, and has an average gradient of 1 in 8·9 and a maximum of 1 in 6·5.

PARTICULARS OF THE CARS COMPETING IN THE SCOTTISH RELIABILITY TRIALS, 1906.

LEADING CHARACTERISTICS.					CONSTRUCTIONAL DETAILS.																					
					ENGINE.						TRANSMISSION.								DIMENSIONS.				TYRES.			
Official No.	Description.	Seats.	Price Complete.	Drive.	Type.	Cylinders.	Bore.	Stroke.	Normal Speed.	Ignition.	Clutch.	Change-speed-gear.	Speeds.						Wheel Base.		Track.		Size.		Make.	Non-skids.
													Number.	"Direct."	1st	2nd	3rd	4th					Back.	Front.		
	h.p.		£				ins. or mm.		r.p.m						m.p.h.				ft.	ins.	ft.	ins.	ins. or mm.			
CLASS A.—Chassis Price not exceeding £200.																										
22	6 Rover	2	125	S	V	1	95	110	900	*b*	*sd*	S	3	*3rd*	7	14	20	—	6	0	4	0	700 × 80	—	Du	
78	7 Ridley	2	135	S	V	1	102	94	1500	*b*	*lc*	U	2	*1& 2*	6	20	—	—	5	4	3	6	28 × 3	28 × 3	Cl	
41	9-10 Adams-Hewitt	2	185	C	H	1	4¾	6	1000	*b, M*	*ba*	E	2	*2nd*	10	25	—	—	6	8	4	2	30 × 3½	—	Du	
65	8 Maxwell	2	194	S	H	2	4	4	900	*b*	*md*	E	2	*2nd*	10	45	—	—	6	0	4	8	750 × 80	—	Du	
45	9-10 Cadillac	2	199	C	H	1	5	5	1000	*b*	*sd*	E	2	*2nd*	8	30	—	—	7	6	4	8½	760 × 90	760 × 90	Du	
21	8 Rover	2	200	S	V	1	114	130	900	*b, m*	*sd*	S	3	*3rd*	8	16	24	—	6	6	4	0	750 × 85	750 × 85	Du	
25	9-10 Swift	2	225	S	V	2	90	110	1250	*b*	*lc*	S	3	*3rd*	8	16	28	—	6	10	4	0	30 × 3¼	30 × 3¼	Du	
69	14 Pope-Tribune	4	236	S	V	2	4½	4½	850	*b*	*lc*	S	3	*3rd*	7	18	26	—	6	10	4	10	760 × 90	—	—	
CLASS B.—Chassis Price exceeding £200 to £350.																										
68	10 Alldays	3	231	S	V	2	3¾	4½	1200	*b*	*lc*	S	3	*3rd*	7	15	25	–	6	6	4	3	28 × 3¼	28 × 3¼	Du	
28	10 Darracq	4	267	S	V	2	100	120	1400	*b*	*lc*	S	3	*3rd*	9	18	31	–	7	1	4	0	760 × 90	760 × 90		
55	10-12 Leader	4	280	S	V	4	$3\frac{5}{16}$	3½	1200	*b*	*lc*	S	3	*3rd*	6	15	30	–	7	6	4	3	30 × 3	—		
80	16 Reo	5	285	C	H	2	4¾	6	800	*b*	—	E	2	*2nd*	10	35	–	–	7	6	4	8	4 × 4	30 × 3½	Go	Ba
12	10-12 Humber	4	290	S	V	4	3½	3¾	1000	*b*	*lc*	S	3	*3rd*	9	20	28	–	8	0	4	0	810 × 90	—	Du	
66	16 Maxwell	4	299	S	H	2	5	5	900	*b*	*md*	S	3	*3rd*	12	20	35	–	7	1	4	8	760 × 90	—	Du	
77	12-14 Victoria	4	325	S	V	4	80	90	—	*b*	*lc*	S	3	*3rd*	–	–	–	–	8	7	4	4	810 × 90	—	Du	
2	16 Albion	4	348	CC	V	2	4⅞	5	950	*M*	*lc*	U	3	*3rd*	7	15	26	–	7	0	4	6	34 × 3½	—	Dc	
70	14 Vulcan	4	350	S	V	4	3½	4¾	1000	*b*	*lc*	S	3	*3rd*	10	20	30	–	8	10	4	2	810 × 90	—	Du	
40	16 Kelvin	4	350	S	V	4	3½	4¾	950	*M*	*lc*	U	3	*3rd*	9	17	30	–	8	7	4	6	810 × 90	—		
14	10-12 Argyll	2	350	S	V	4	95	140	1100	*b*	*lc*	U	3	*3rd*	6	13	26	–	6	3	4	1	810 × 90	—		
4	12-15 Arrol-Johnston	4	410	S	H	2	4¼	6½	800	*M*	*md*	S	4	*4th*	6	13	20	28	8	9	4	4½	810 × 90	810 × 90	Ct	
54	14-17 Scout	5	450	S	V	4	83	115	1200	*b, m*	*lc*	S	3	*3rd*	9	22	28	–	8	5	4	5	810 × 90	—	Ct	
75	14 Scottish Aster																									
CLASS C.—Chassis Price exceeding £350 to £500.																										
5	12 Arrol-Johnston	4	390	C	H	2	4¼	6½	800	*M*	*lc*	S	4	—	5	10	18	25	5	6	4	4½	42 × 2¼	36 × 2¼	S.C.	
56	16-20 Leader	5	410	S	V	4	3⅝	5	1000	*b*	*lc*	S	3	*3rd*	8	20	44	—	8	11	4	3	32 × 3½	—		
11	15 Darracq	4	449	S	V	4	90	120	1000	*b*	*lc*	S	3	*3rd*	11	22	37	—	7	11	4	4	810 × 90	—		
15	12-14 Argyll	4	450	S	V	4	84	110	1250	*b*	*lc*	U	3	*3rd*	7	15	30	—	7	9	4	1	810 × 90	—		
16	14-16 Argyll	5	475	S	V	4	90	120	1100	*b*	*md*	U	3	*3rd*	7	15	30	—	8	4	4	1	810 × 90	—		
44	16-20 Chenard-W.	4	485	S	V	4	86	130	900	*bm*	*lc*	S	3	*3rd*	8	16	35	—	8	7	—		810 × 100	810 × 90	Ct	Ct
30	22 Minerva	5	485	S	V	4	102	115	1000	*bm*	*lc*	S	3	*3rd*	10	17	33	—	9	5	4	5	815 × 105	810 × 90	Du	
10	16-20 Humber	4	495	S	V	4	100	130	900	*bm*	*lc*	S	4	*4th*	10	20	30	40	8	10	4	3	815 × 105	—	Du	
62	12-16 Talbot	4	495	S	V	4	85	120	1000	*bm*	*lc*	S	4	*4th*	8	19	30	44	8	6	4	7	815 × 105	810 × 90	Cl	Pa
35	18-24 Courier	5	500	S	V	4	98	130	1000	*bm*	*lc*	S	3	*3rd*	10	20	40	—	9	6	4	2	32 × 5	32 × 4	Mo	
42	14-20 Vinot	4	500	CC	V	4	90	130	900	*m*	*lc*	S	3	*3rd*	10	22	35	—	9	2	4	5	880 × 120	875 × 105	Du	
18	15 Siddeley	4	500	S	V	4	4	4	1000	*m*	*lc*	S	3	*3rd*	9	20	32	—	9	6	4	3½	34 × 3½	—	Mi	Mi
19	14-22 Germain	4	515	S	V	4	3⅝	$4\frac{5}{16}$	1050	*m*	*lc*	S	3	*3rd*	—	—	—	—	8	8	4	1	815 × 105	—	Du	Sa
72	20 Calthorpe	5	525	S	V	6	80	90	1500	*b*	*md*	S	3	*3rd*	10	19	32	—	8	7	4	4	34	875 × 105	Du	
49	18-22 Speedwell	4	525	S	V	4	98	130	1000	*m*	*lc*	S	3	*3rd*	11	22	44	—	9	6	4	3	880 × 120	880 × 120	Ct	Ct
13	16-20 Sunbeam	4	530	CC	V	4	95	120	1000	*bm*	*lc*	S	4	*4th*	9	20	30	40	9	8	4	4	870 × 105	870 × 105	Du	
57	20-22 Mobile	4	539	S	V	4	95	130	1000	*bm*	*lc*	S	3	—	—	—	—	—	—		—		—	—	Du	
17	16-20 Argyll	4	550	S	V	4	95	130	1100	*b*	*md*	U	3	*3rd*	9	17	35	—	9	0	4	1	875 × 105	—		
51	14-18 Marchand	4	558	CC	V	4	85	90	1400	*m*	*md*	S	3	*3rd*	11	18	35	—	8	10	4	6	810 × 100	810 × 100	Du	
37	15 De Dion	4	565	S	V	4	90	100	1500	*bm*	*sd*	S	3	—	2	18	30	—	8	10	4	1	815 × 105	—	Ct	Ro
61	24 Mass	5	575	S	V	4	110	130	—	*bm*	*lc*	S	3	*3rd*	11	25	35	—	10	0	4	3	880 × 120	870 × 90	Du	Wa
53	12-16 Wilson-Pilcher	4	580	S	H	4	3¾	3¾	900	*b*	*md*	E	4	*4th*	6	10	16	24	8	4	4	2	915 × 105	915 × 90	Du	
CLASS D.—Chassis Price exceeding £500 to £650.																										
27	20-32 Darracq	4	549	S	V	4	112	120	1000	*b*	*lc*	S	3	*3rd*	10	22	40	—	10	0	4	5	880 × 120	870 × 90		
34	20-30 Enfield	4	550	S	V	4	120	127	900	*bm*	*lc*	S	3	*3rd*	10	20	36	—	9	6	4	7	810 × 120	815 × 105	Du	
71	20-24 Talbot	5	596	S	V	4	100	120	1000	*bm*	*md*	S	4	*4th*	12	25	40	55	9	9	4	7	880 × 120	875 × 105	Cl	Pa
3	18 Gladiator	5	600	CC	V	4	95	130	1200	*bm*	*md*	S	4	*4th*	8	17	25	40	9	9	4	6	880 × 120	875 × 100	Du	
73	20-24 Horbick	4	600	S	V	4	108	114	1000	*m*	*lc*	S	3	*3rd*	10	20	40	—	9	0	4	3	815 × 105	—	Ct	
79	20-28 Spyker	4	600	S	V	4	110	120	1000	*b*	*lc*	S	3	*3rd*	6	10	30	—	9	6	4	6	870 × 120	—	Ct	
38	30-36 Drummond	5	614	S	V	4	127	127	700	*b*	*lc*	S	3	*3rd*	13	25	36	—	9	3	4	8½	—	—	Ct	Ct
46	25-30 Austin	4	650	CC	V	4	4½	5	900	*bM*	*md*	S	4	—	13	19	27	37	9	9	4	7	920 × 120	910 × 100	Du	
83	25 Straker-Squire	5	675	S	V	4	110	130	850	*M*	*lc*	U	3	*3rd*	—	—	—	—	9	8	4	7	880 × 120	880 × 90	Mi	
8	25 Brooke	5	680	S	V	6	3⅝	4¾	950	*m*	*md*	S	4	*3rd*	10	20	30	40	10	0	4	8	880 × 120	870 × 90	Du	

LEADING CHARACTERISTICS.					CONSTRUCTIONAL DETAILS.																					
					Engine.						Transmission.								Dimensions.				Tyres.			
													Speeds.										Size.			
Official No.	Description	Seats.	Price Complete.	Drive.	Type.	Cylinders.	Bore.	Stroke.	Normal Speed.	Ignition.	Clutch.	Change-speed-gear.	Number.	"Direct."	1st	2nd	3rd	4th	Wheel Base.		Track.		Back.	Front.	Make.	Non-skids.
	CLASS D.—Chassis Price exceeding £500 to £650—*continued.*																									
	h.p.		£				ins. or mm.		r.p.m.						m.p.h.				ft.	ins.	ft.	ins.	ins. or mm.			
20	20–30 Maudslay ...	4	700	CC	V	4	4½	4	800	*bm*	*lc*	S	4	*4th*	10	18	26	35	10	5	4	5½	880 × 120	—	Ct	
76	30 Bell	4	700	CC	V	4	118	150	800	*bm*	*md*	S	4	*4th*	8	18	26	40	9	9	4	7½	880 × 120	870 × 100	Ct	
7	24–30 Arrol-Johnston	4	700	S	V	4	4¼	5	900	*bM*	*md*	S	4	*4th*	8	17	25	36	9	6	4	4½	915 × 105	—	Ct	
6	18 Arrol-Johnston ...	4	720	S	H	2	4¾	6½	800	*M*	*md*	S	4	*4th*	12	21	31	45	7	6	4	4½	815 × 105	—	Ct	
1	24 Albion	4	722	CC	V	4	4¼	4½	1200	*M*	*md*	S	3	*3rd*	9	17	35	—	9	2	4	7	35 × 5	—	Du	
32	25–30 Iris	4	725	S	V	4	4¼	5¼	1000	*m*	*md*	S	3	*3rd*	10	18	34	—	10	0	4	5	880 × 120	875 × 105	Ct	
50	28 Ariel Simplex ...	4	725	S	V	4	4¾	5½	1000	*b*	*lc*	S	4	*4th*	10	21	32	42	9	7	4	7	880 × 120	—	Du	
23	20 Rolls-Royce ...	—	735	S	V	4	4	5	1000	*b*	*lc*	S	4	*3rd*	11	26	39	54	8	10	4	4	810 × 100	810 × 90	Du	
39	20–30 Pilain... ...	4	740	S	V	4	114	150	850	*M*	*dc*	U	4	*3&4*	9	17	27	37	9	4	4	4	880 × 120	—	Mi	
	24–32 Gladiator ...	5	750	CC	V	4	105	140	1000	*bm*	*md*	S	4	*4th*	10	21	30	45	10	5	4	6	880 × 120	875 × 100	Du	
29	18–24 Peugeot ...	—	750	CC	V	4	105	106	1350	*M*	*lc*	S	4	*4th*	12	21	32	46	10	2	4	8	915 × 105	—	Ct	
8	25 Siddeley	4	750	CC	V	4	4½	5	900	*M*	*lc*	S	4	—	10	20	30	40	10	2	4	7	36 × 5	36 × 3½	Mi	
36	28 Pipe	4	800	CC	V	4	100	120	1000	*bm*	*mc*	S	4	*4th*	12	18	30	40	10	3	4	9	880 × 120	870 × 90	Mi	Mi
43	30–40 Chenard-W. ...	5	—	S	V	4	120	130	1000	*bm*	*lc*	S	4	—	12	20	35	50	9	0	3	0	880 × 120	—	Mi	
48	24–30 St. Vincent ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—		—	—		
	CLASS E.—Chassis Price exceeding £650.																									
64	30–40 Belsize ...	4	725	S	V	4	4⅝	5	1000	*b*	*md*	S	3	*3rd*	10	30	40	—	10	1	4	3	34 × 5	—	Du	
33	30–40 Humber ...	4	800	S	V	6	110	120	1000	*b, m*	*lc*	S	4	*4th*	15	25	35	45	9	11	4	5	880 × 120	875 × 105	Du	
59	25–36 Brasier ...	5	810	CC	V	4	112	130	1000	*M*	*lc*	S	4	—	—	—	—	46	9	6	4	6	880 × 120	875 × 105	Ct	
52	28–36 Armstrong-W.	4	815	S	V	4	5	4	900	*b, M*	*md*	S	4	*4th*	8	15	25	40	9	8	4	2	920 × 120	—	Du	
60	35 Ariel-Simplex ...	4	850	S	V	4	5	5½	900	*b*	*lc*	S	4	*4th*	12	26	39	53	9	7	4	7	920 × 120	—	Du	
74	30–35 Metallurgique	4	865	S	V	4	108	140	900	*b, m*	*md*	S	4	*4th*	10	20	30	45	9	6	4	6	880 × 120	875 × 105	Mi	De
63	24–34 Belsize ...	4	875	S	V	6	4	4¼	1000	*b*	*md*	S	3	*3rd*	8	25	35	—	10	1	4	3	36 × 5	—	Mo	
67	35 Ariel-Simplex ...	4	925	S	V	6	4½	5½	900	*b*	*lc*	S	4	*4th*	12	26	39	53	9	10	4	7	880 × 120	—	Du	
26	30 Daimler	5	940	CC	V	4	124	150	650	*b*	*lc*	S	4	—	13	22	31	39	8	6	4	7	880 × 120	880 × 120	Mi	
24	30 Rolls-Royce ...	—	945	S	V	6	4	5	1000	*b*	*lc*	S	4	*3rd*	13	22	38	47	9	10	4	4	880 × 120	870 × 90	Du	
47	30–40 Martini ..	5	950	CC	V	4	125	140	1000	*M*	*ex*	S	4	*4th*	—	—	—	—	9	8½	4	7½	920 × 120	915 × 105		
31	30–40 Peugeot ...	—	1050	CC	V	4	130	120	1250	*M*	*lc*	S	4	*4th*	15	25	39	55	10	4	4	0	920 × 120	—		
—	40 Benz	4	—	CC	V	4	120	130	1000	*b, M*	*lc*	S	4	—	—	—	—	—	10	5	4	9	935 × 135	920 × 120	Ct	

Leading Characteristics—
Drive.—S = Propeller Shaft ; SW = Propeller Shaft with worm drive ; C = Single Chain ; CC = Side Chains.
Engine—
Type—D = Diagonal ; V = Vertical ; H = Horizontal.
Ignition—*b* = Battery ; *m* = High-tension Magneto ; *M* = Low-tension Magneto.
Transmission—
Clutch—*lc* = Leather Faced Cone ; *mc* = Metal Cone ; *md* = Multiple Disc ; *sd* = Single Disc ; *ex* = Expanding ; *sc* = Scroll ; *dc* = Double Cone (leather and metal) ; *hy* = Hydraulic ; *ba* = Band.
Change-speed-gear.—S = Sliding Spur ; E = Epicyclic ; U = Unusual.
Tyres—
Du = Dunlop ; Ct = Continental ; Pa = Palmer ; Co = Collier ; Mi = Michelin ; Mo = Moseleys ; Go = Goodyear ; S.C. = Shrewsbury and Challiner ; Dc = Ducasble ; Cl = Clincher.
Non-Skids—
Ct = Continental ; De = Desclée ; Mi = Michelin ; Wa = Wallwork ; Ba = Bailey ; Ro = Rougeferre ; Sa = Samson ; Pa = Parsons.

Note.—Where particulars do not appear in the above table, makers have failed to send the information asked for.

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The Bridge-of-Avon hill climb occurs on the third day between Tomintoul and Grantown, the hill has an average gradient of 1 in 9, rising to 1 in 6, and is 790 yards long; while there is yet another test at Trinafour on the last day, as the cars are travelling from Pitlochry to Killin, *viâ* the Pass of Killiecrankie and Blair Athol. This last hill is 1,817 yards long, and has an average grade of 1 in 14·7, which rises to 1 in 7·5.

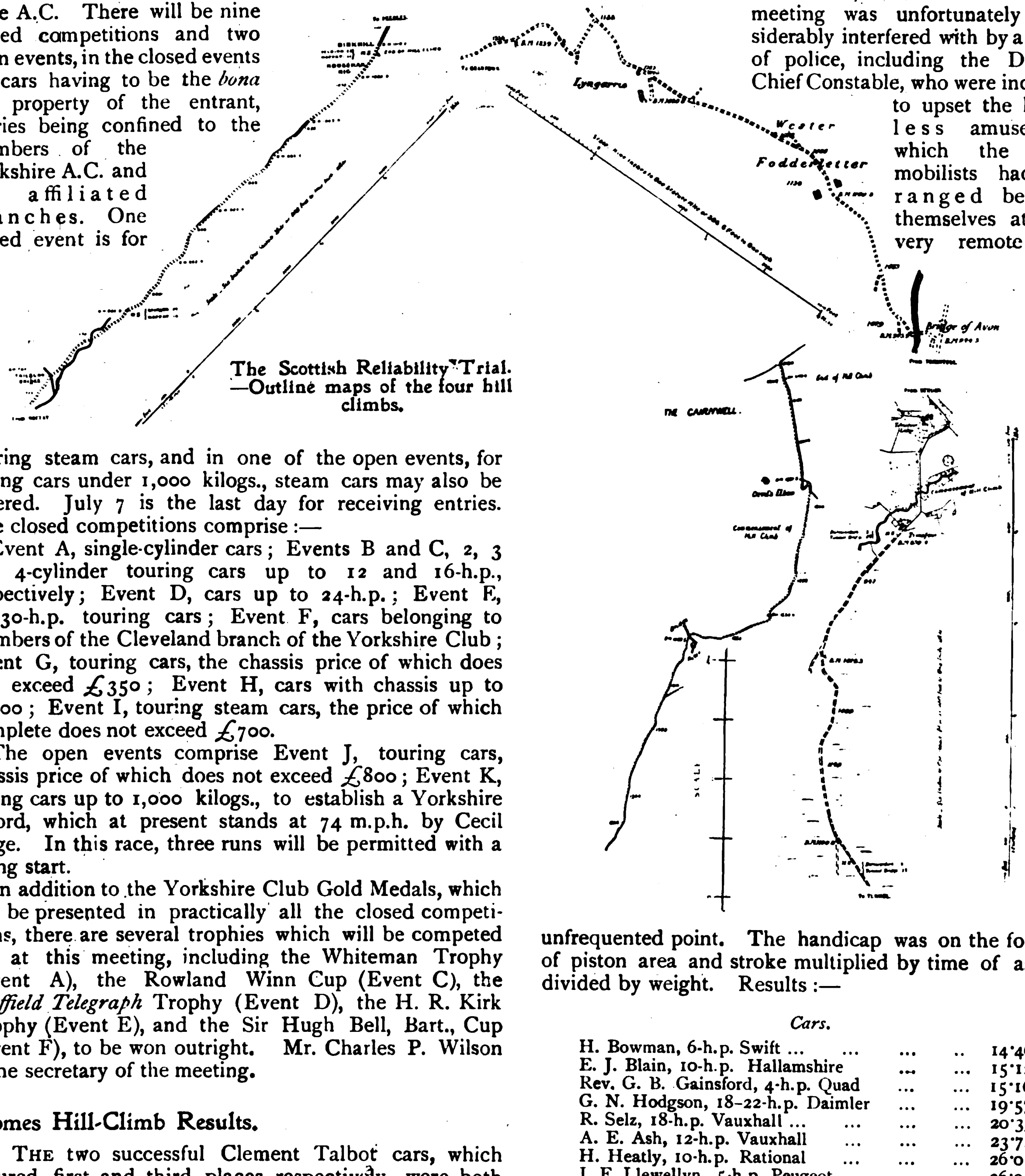
As to the efficient organisation of this very important event, there need be few misgivings, for the Western Section of the Scottish Automobile Club have had one year's experience, and it is obvious already that their energetic hon. secretary, Mr. R. J. Smith, has everything, to the minutest detail, at his finger tips. The programme containing the rules and conditions is one of the most complete and lucid compilations which we have ever seen issued in connection with any trial of the kind, and if general appearances are anything to judge by, there is every reason to expect that this trial will be even more successful than was the last. The cars will be officially observed, on behalf of the War Office Mechanical Transport Committee, by Majors F. Lindsay Lloyd and W. E. Donohue.

Du Pré Challenge Cup.

In consequence of the difficulty of making the necessary arrangements for the Inter-Club Hill-Climb, for the Du Pré Challenge Cup, which was to have taken place last Saturday, it has now been arranged by the Derby A.C. to be held on Saturday, June 23rd. The Reliability Trials, which were to be held on June 16th, will be run off on August 18th.

Saltburn Speed Trials.

PARTICULARS are announced of the racing which is to take place, on July 14th, on the sands between Saltburn and Redcar, under the auspices of the Yorkshire A.C. There will be nine closed competitions and two open events, in the closed events the cars having to be the *bona fide* property of the entrant, entries being confined to the members of the Yorkshire A.C. and its affiliated branches. One closed event is for touring steam cars, and in one of the open events, for racing cars under 1,000 kilogs., steam cars may also be entered. July 7 is the last day for receiving entries. The closed competitions comprise:—



The Scottish Reliability Trial.—Outline maps of the four hill climbs.

Event A, single-cylinder cars; Events B and C, 2, 3 and 4-cylinder touring cars up to 12 and 16-h.p., respectively; Event D, cars up to 24-h.p.; Event E, 20–30-h.p. touring cars; Event F, cars belonging to members of the Cleveland branch of the Yorkshire Club; Event G, touring cars, the chassis price of which does not exceed £350; Event H, cars with chassis up to £600; Event I, touring steam cars, the price of which complete does not exceed £700.

The open events comprise Event J, touring cars, chassis price of which does not exceed £800; Event K, racing cars up to 1,000 kilogs., to establish a Yorkshire record, which at present stands at 74 m.p.h. by Cecil Edge. In this race, three runs will be permitted with a flying start.

In addition to the Yorkshire Club Gold Medals, which will be presented in practically all the closed competitions, there are several trophies which will be competed for at this meeting, including the Whiteman Trophy (Event A), the Rowland Winn Cup (Event C), the *Sheffield Telegraph* Trophy (Event D), the H. R. Kirk Trophy (Event E), and the Sir Hugh Bell, Bart., Cup (Event F), to be won outright. Mr. Charles P. Wilson is the secretary of the meeting.

Fromes Hill-Climb Results.

THE two successful Clement Talbot cars, which secured first and third places respectively, were both 12-16-h.p. models, and differed only in respect of their length. In our table of results published last week, Lord Shrewsbury's entry was specified as having a 10-12-h.p. engine.

The Wilson Challenge Cup Competition to be Re-Run.

IT has been decided by the Nottingham A.C. to re-run the Flying Kilometre Handicap Contest for the Wilson Challenge Cup at the Skegness Trials next September.

Gravel Hill Climb.

THE results of the handicap for this hill climb, which was held at the end of last month under the auspices of the North Hertfordshire Club, are as under. The meeting was unfortunately considerably interfered with by a force of police, including the Deputy Chief Constable, who were inclined to upset the harmless amusement which the automobilists had arranged between themselves at this very remote and unfrequented point. The handicap was on the formula of piston area and stroke multiplied by time of ascent, divided by weight. Results :—

Cars.

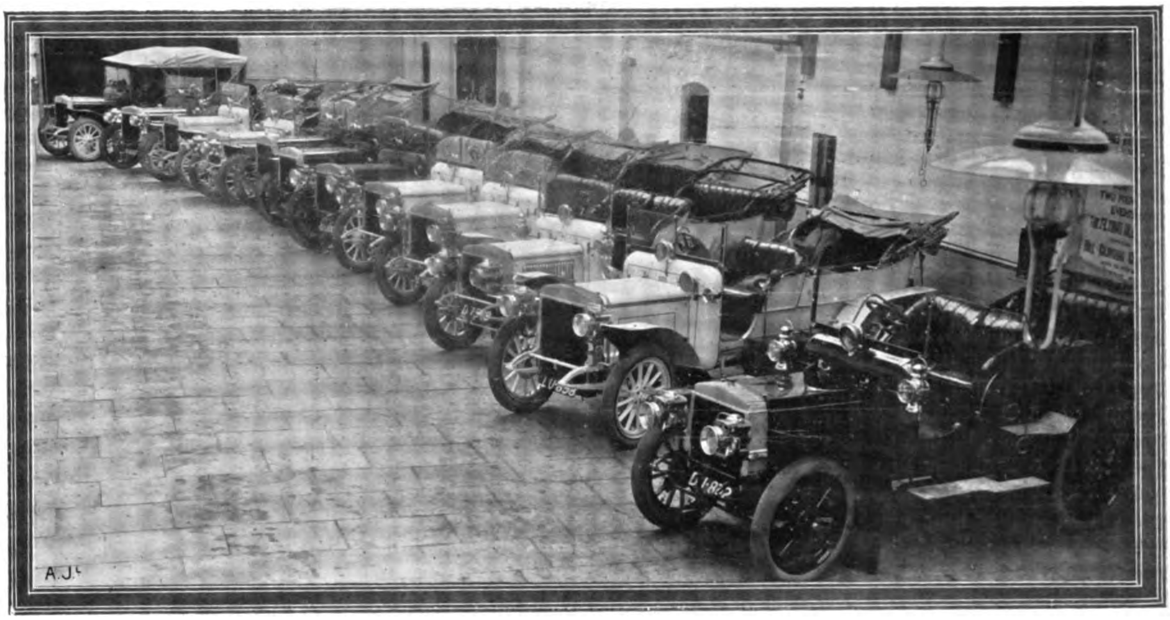
H. Bowman, 6-h.p. Swift	14·46*
E. J. Blain, 10-h.p. Hallamshire	15·12
Rev. G. B. Gainsford, 4-h.p. Quad	15·16
G. N. Hodgson, 18–22-h.p. Daimler	19·57
R. Selz, 18-h.p. Vauxhall	20·33
A. E. Ash, 12-h.p. Vauxhall	23·72
H. Heatly, 10-h.p. Rational	26·01
J. E. Llewellyn, 5-h.p. Peugeot	26·94
Dr. E. H. Cobb, 10-12-h.p. Argyll	34·57†
S T. Gresham, 10-h.p. Rational	36·04†
H. Kenneth, 28–36-h.p. Daimler	42·68†

* Disqualified for not carrying full complement of passengers.

† These three cars did not seriously compete, owing to the overawing force of constabulary.

Cycles.

W. Y. Taylor, 2¾-h.p. Kerry	14·48
J. H. Gilbertson, 2¾-h.p. Ivel	19·03
H. Francis, 5-h.p. Peugeot	27·08
Dr. H. C. Hodges	69·69
A. W. Deards, 2¼-h.p. Ariel	(No return)



HERKOMER TROPHY.—The team of Daimler cars which are taking part in the Herkomer Trophy Contest. Our photograph was taken immediately before the start for Frankfort.

HERKOMER TROPHY.

FOR this important tourist trial, which commenced on Wednesday of this week, a splendid team of fourteen Daimler cars were entered to represent Great Britain. They will be driven by Mrs. Manville, Lord Montagu of Beaulieu, Captain D. Hughes Morgan, Herr Kommerzienrat Ephriam, Messrs. W. Herdman Ash, Philip Dawson, Charles Hardy, G. F. Heublein, A. G. Grigg, A. Birtwistle, Robert Stotesbury, F. Rendle, P. Martin, and Gino de Martino.

Remembering the fact that in last year's contest the three Daimler cars which took part succeeded in coming in amongst the first on each day's run, with the exception of troubles from tyres, we may look forward to unalloyed success attending this year's cars from the fact that troubles with tyres will not militate to the same extent under the rules governing this year's trophy against the reliability of the competing vehicles. The finish of the trial is on June 14th, the course being through Nürnburg, Munich, Innsbruck, Franzensfeste, Klagenfurt, Vienna, Salsburg, Munich, and back to Frankfort. The entries, which totalled to about 150, as we have already intimated, include one from Prince Henry of Prussia. One announcement we regret having to make, and that is the absence of Mr. Charles Jarrott from the list of those who will actually take part, he having at the last moment found it impossible to leave England on account of very important business engagements.

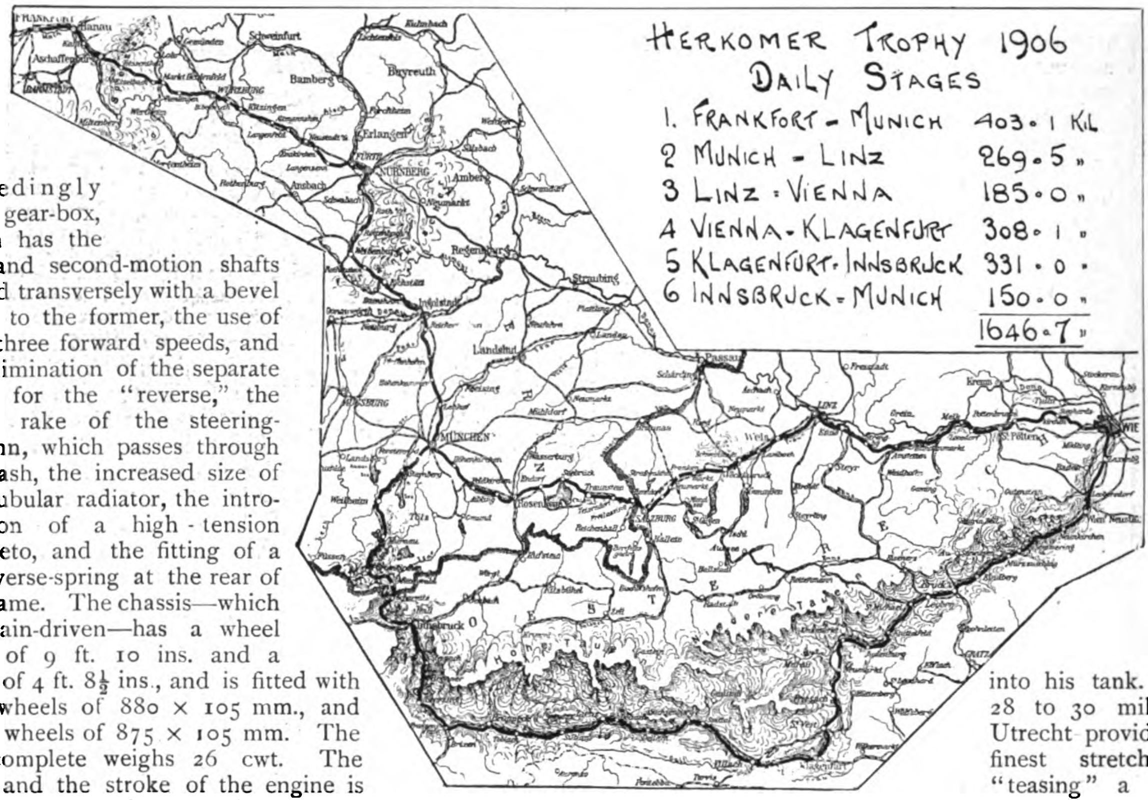
En route to the Course.

When the rain comes down in torrents for days—nay, even weeks—together, and a glimpse of sunshine is sought in vain, our little party might be pardoned for coming to the conclusion that they were still in England, although, as a matter of fact, we are, at the moment of writing, at Frankfort-on-Maine, this year the starting point of the second International Touring Car Competition for the Herkomer Trophy. On this occasion the responsible bodies are the Imperial German, Austrian, and Bavarian Automobile Clubs, who have been successful in increasing the entry list by nearly 50 per cent., there being 159 cars as against 102 last year. Notable among the new competitors are Prince Henry of Prussia, whose car will be driven by Duke van Bojano, and Victor Lancia, who has just won the Milan Gold Cup, the latter posing as an amateur motorist "by kind permission of the German Automobile Club," as it were. Great Britain is represented by a team of thirteen cars, twelve of them being Daimlers, the other being Mr. Robertson Grant's Argyll. Of the former, nine are entirely new models, rated at 45 h.p. The performance of the "35's" last year has caused the Germans to regard the Coventry products with a very jealous eye, yet with frank admiration, and on arrival here it was found that their fame had preceded them, so that the new cars were the object of much interest.

Not the least interesting point about these models is that the raw material for their construction was not ordered until April 2nd; the final cylinder was received from the foundry to put on the last of the nine engines a fortnight later, and from that date until the time the nine cars had been built, tested, and equipped with the body work which is now on them, was precisely six weeks, the machines actually leaving Coventry for this competition.

In appearance the finished cars are uncommonly striking, for the frame has been dropped very low by the dipping of the front axle, while at the rear the frame is raised. Even so, however, the centre of gravity is no lower than in the 35-h.p. models, because the engine and other parts of the mechanism are relatively higher, and have actually a greater clearance of the ground. The engine itself embodies three distinct new features, the four cylinders are cast in one piece, ball-bearings are used in the crank-shaft, and the crank-shaft itself is made in two pieces.

The object of this latter departure is to achieve a better and neater fitting for the central ball-bearing of the three which support the crank-shaft. Other features embodied in the new Daimler models are the pressed-steel frame, which is parallel from end to end, the



exceedingly novel gear-box, which has the first and second-motion shafts placed transversely with a bevel drive to the former, the use of only three forward speeds, and the elimination of the separate lever for the "reverse," the sharp rake of the steering-column, which passes through the dash, the increased size of the tubular radiator, the introduction of a high-tension magneto, and the fitting of a transverse-spring at the rear of the frame. The chassis—which is chain-driven—has a wheel base of 9 ft. 10 ins. and a track of 4 ft. 8½ ins., and is fitted with rear wheels of 880 × 105 mm., and front wheels of 875 × 105 mm. The car complete weighs 26 cwt. The bore and the stroke of the engine is 150 mm., and the single-lever system of control has been retained. By making the induction and exhaust ports in pairs the pipe work has been considerably simplified, and the chain-drive from the starting-handle has been abolished. It says much for these machines that despite the roads over which they were driven after leaving Rotterdam, not a car has shown the slightest signs of weakness. The road from Rotterdam was that which the members of the A.C.G.B.I. followed on the occasion of the 1904 Gordon-Bennett race on the Taunus course.

Of the present party Lord Montagu of Beaulieu was the only owner of a 45-h.p. car who did not make the stage by road, having left the car to the care of his chauffeur. The other eight "Besitzers" who drove their cars of this type were Captain D. Hughes Morgan, Signor Gigno de Martino, Mr. Charles Hardy (President of the Nottingham Automobile Club), Mr. Arthur Birtwistle, Mr. Robert Stotesbury, Mr. W. Herdman Ash, Mr. Philip Dawson and Mr. Frank Rendle, whose car is being driven by his son, Mr. William Rendle. It will be recalled that the last three figured in the previous competition, as did Mrs. Edward Manville, who will again be the only lady competitor, and who has such faith in her "35," with which she beat all rivals in the speed trials, that she is taking over the identical machine which figured in the former competition. The remaining two 35-h.p. Daimler cars will be driven by Mr. A. Griggs and Mr. G. F. Heublin. Mr. J. W. Orde, the secretary of the A.C.G.B.I., is accompanying the Daimler team to represent the interests of the British club and its competitors.

Incidents in the run from Rotterdam were few but interesting. They may be said to have begun when Mr. Charles Hardy discovered that the people landing his car were hauling it ashore by means of a rope attached to the steering column. A moment later, Mr. Willie Rendle discovered a retailer of petrol pouring white lead into his tank. The 28 to 30 miles to Utrecht provides the finest stretch for "teasing" a high-powered motor that one could possibly wish, the mean speed in this case working out at 10 miles an hour. Overtaking is impossible, owing to the narrowness of the serpentine brick-paved and dusty roads. Windmills, cows, flatlands, canals, nervous horses, and the clatter of white clogs accompanied us all the way to the famous Treaty town, where we halted for luncheon. The country gradually opened out as Arnheim was approached, and at Nymwegen we had a fine prospect of the cathedral spires, and of an old tower almost buried in the wealth of foliage on the hill-side where it was built.

After crossing the frontier, our way lay through the beautiful Imperial forest of Reichswald, and after passing through Geldern we drove to the great manufacturing town of Krefeld. Here it was, it will be remembered, that the German Emperor quartered a regiment of his green and silver-robed Uhlans, because it had been reported to him that the young ladies lacked partners to dance with. Cologne and Bonn were the next big towns *en route*, and presently we began pursuing our way up the Rhine Valley. From Coblentz to Mainz is an easy stage and provides pleasant going, which is more than can be said of the remaining twenty miles between that town and Frankfort, which we reached without further incident. On Sunday the Daimler party went for a little excursion on the Taunus course to try the cars up the hills, and the final tuning-up trip was a run to and from the famous Saalburg.

It must be pointed out that by reason of the particularly fine performances by the Daimler machines in the speed tests last year the German Automobile Club has devised a new system of handling its entries, and one that is generally considered here to be the fairest of any so far forthcoming. By this system, too, the cars are started off according to their engine power, the largest going first. For the flat race the officials of the club have plotted a curve on the understanding that the speed of a car is proportionate to its horse-power. A line at the base of the diagram represents the cylinder capacity in cubic *litres* and fractions of a *litre*, while a vertical line on the left represents miles per hour. Three cars of varying engine powers are taken over the course, and the results entered at three points on this diagram. These points form the basis of a curve from which the arbitrary speed to be achieved by a machine of any type over that course can be ascertained. The word arbitrary is used because weight has evidently been taken as a constant, but, despite this, wind resistance has plainly been considered, for there are two curves, one for open cars and one for those having closed bodies. In this connection it may be pointed out that the Daimler machines, with their broad wind-shields, will be at some disadvantage, for no allowance will be made for the extra displacement for fitting such conveniences. The system of marking is as follows: Suppose your engine capacity is such as your speed should be 70 miles an hour, and you only do 68 miles an hour, you will have minus marks awarded for the two miles per hour below what you should have done. If you just do 70 miles an hour you receive zero marks, while if you do anything over 70 miles an hour you receive marks in your favour for whatever you have done over that speed. The same applies to the hill climb, and it is evident that the German officials, in making out their curves, have tried the course with cars having various bodies and various horse-powers. The maximum rise for the timed hill climb up the Semmering Pass is 1 in 14. The road is good, being mostly macadam, but there are several very bad turns. H. M. B.

The Continental Tyre Company are endeavouring to assist drivers using their tyres by establishing twenty tyre depôts on the route. These will be stationed at the following places:—

Frankfort, Wurzburg, Furth, Ingolstadt, Munich, Rosenheim, Salzburg, Vocklabruck, Linz, St. Polten, Vienna, Murzzuschlag, Bruck, Judenburg, Klagenfurt, Sachsenburg, Franzensfeste, Innsbruck, Murnau, Munich. Ten of the British team are using Continental tyres, while in all there are no less than 86 cars fitted with them.

Mill Moor Road Hill Climb.

Over a course of 1 mile 47 yards, near Meltham, this hill climb was, at the end of May, held by the Huddersfield branch of the Yorkshire A.C. There are two sharp turns in the hill, and the gradient is moderately steep. The trial was a handicap, the following being the chief results with points in each class:—

Class A.

W. B. Lawton, 8–9-h.p. Corre, medal, points 124.
F. A. Dawson, 6-h.p. De Dion, points 122.
J. W. Hobson, 8-h.p. De Dion, points 96.

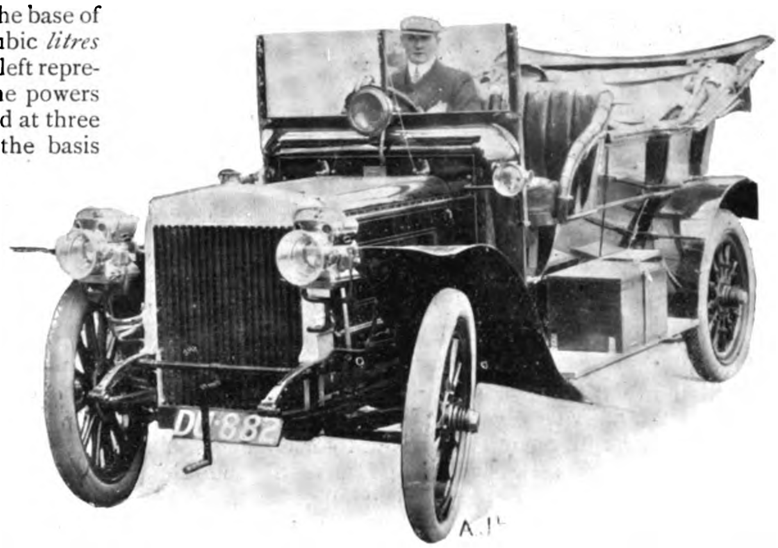
Class B.

W. Singleton, 10-h.p. De Dion, medal, points 136.
A. Herman Sykes, 10–12-h.p. Argyll, points 133.
F. Sutcliffe, 10-h.p. De Dion, points 131.

Class C.

D. Stoner Crowther, 40-h.p. Napier, medal, points 124.
A. Farnell, 30-h.p. Daimler, points 117.
H. Walker, 30-h.p. Daimler, points 114.

Mr. W. Singleton secured the medal of his class, and also the Cup by means of his 136 points, the highest. Mr. Farnell's 30-h.p. Daimler made the fastest time; Mr. H. Walker's car of the same type being next.



HERKOMER TROPHY.—Capt. D. Hughes-Morgan on his new 45-h.p. Daimler Car, which he is driving this week in the Herkomer Trophy Contest.

400 Miles Reliability Run.

The North-east Lancashire A.C. recently held a long-distance trial from Whalley to Edinburgh. The run was a "non-stop" one, except for lunch and traffic stops. An allowance of one hour was made on the entire journey for tyre troubles, and no adjustments were permitted. Twenty-eight cars started in the morning, and of these the following ten came through the trial successfully without a stop, each being awarded a gold medal:—

B. Hacking (18–24-h.p. Belsize)
J. Bibby (28–36-h.p. Daimler)
C. F. Bury (28–36-h.p. Daimler)
G. Burton (28–36-h.p. Daimler)
J. Briggs-Bury (30-40-h.p. Daimler)
W. D. Coddington (30–40-h.p. Daimler)
H. Lonsdale (30–40-h.p. Daimler)
R. Mangnall (40-h.p. Napier)
A. Birtwistle (35-h p. Daimler)
F. Birtwistle (60-h.p. Mercedes)

Night and Day 1,000 Miles "Non-Stop" Run.

In connection with this official A.C.G.B.I. trial, of which we recorded the chief results in our issue of May 12th, the full report has now been published by the club. It confirms what was previously said with regard to the performance of this 18-h.p. Regent car, it gives the weight (ready for the road, but without the four passengers—600 lbs.) as having been 2,353 lbs., and it concludes with the following remarks concerning the condition after trial:—

> The contact pieces inside the cylinders and the top end of the igniter push-rods were worn, so as to interfere with the timing of the ignition. This trouble was increased by the igniter operating arms turning upon the taper ends of their rock-shafts.
>
> Otherwise the engine and the clutch showed no undue wear in any of their parts.
>
> Owing to the lack of clearance, the first-speed spur-wheel on the main-shaft had cut into the wall of the gear-box, and the sleeve of the gear-change-rod; this caused much metallic dust, which probably was the occasion of the wear and scoring discovered between the reverse pinion and its shaft.
>
> The edges of the teeth of all the change-speed wheels had been appreciably bruised in gear changing.
>
> The difficulty that was experienced in operating the reverse was found to be partly due to the construction of the sliding-rod, and other parts inside the gear-box, and partly to the position of the driver's seat stopping the travel of the speed-lever.
>
> An undue amount of play was found close behind the gear-box

inside the brake-drum, between the main-shaft and the forward end of the universal-joint. The brake-drum casting, through which the whole power is transmitted, was found to be seriously cracked from the key-way outwards.

The main bevel-gears were not appreciably worn, but some of the teeth had been somewhat indented by foreign matter, which had apparently found its way into the differential case.

Slight side play was found in the near side front wheel, due to too much clearance having been allowed between the thrust-collar and the corresponding shoulder.

The engine runs very smoothly, and with little vibration, even when raced on first speed.

The top gear was quiet, but there was some noise when the other gears were in use, probably due to the gear-wheels fouling the gear-box. The changing of gear throughout the trial was difficult, and this was especially the case with the reverse.

The control was easy and effective.

The tyres ran throughout without trouble.

London to Edinburgh.

VERY gratifying success attended the annual run on June 1st and 2nd, organised by the Motor Cycling Club, to Edinburgh from London in 24 hours. By the rules, an average maximum speed of 20 miles an hour was allowed, and each competitor arriving in Edinburgh within that limit was classed co-equal. The start, when slight rain was experienced, was on Friday night, from the Gate House, Highgate, at 10 p.m., entrants being despatched at 30 second intervals. Of the 84 competitors no less than 44 qualified for a full certificate, having reached the Scottish capital within the specified 24 hours after leaving London. Two of the drivers were of the gentler sex, viz., Miss Agnes Wood, on a Clement-Talbot car, and Miss Muriel Hind, on a Singer tricar, both of whom were successful in the run. This was also the first public run of the new Maxwell car, which successfully accomplished its task.

The following are the competitors and their machines, in alphabetical order, who succeeded in reaching Edinburgh to schedule time:—

Motor Cars.

J. Platt Betts, 6-h.p. Rover; A. J. Brown, 10-h.p. Peugeot; C. W. Brown, 6-h.p. Rover; F. J. Jenkins, 16-h.p. Rover; F. W. Peckham, 8-h.p. Maxwell; W. E. Price, 6-h.p. De Dion; S. J. Sewell, 16-h.p. Rover; J. W. Stocks, 8-h.p. De Dion; H. Taylor, 14-h.p. Pope Tribune; Miss Agnes Wood, 12–15-h.p. Clement-Talbot.

Quadcar.

J. Van Hooydonk, 6-h.p. Phœnix.

Tricars.

A. Clifford Earp, 9-h.p. Singer; Wilbur Gunn, 10-h.p. Lagonda; Miss Muriel Hind, 9-h.p. Singer.

Motor Bicycles.

E. W. Ashworth, 4-h.p. Werner; D. S. Baddeley, 3½-h.p. Baddeley; L. A. Baddeley, 3½-h.p. Baddeley; G. A. Badenock, 2¾-h.p. machine; J. A. Bailey, 5-h.p. Vindec; L. W. Bellenger, 3½-h.p. Quadrant; H. E. Blackney, 4-h.p. Werner; F. M. Bond, 3½-h.p. F.N.; Hubert Bond, 3½-h.p. F.N.; R. G. Booth, 5-h.p. Vindec; R. M. Brice, 3½-h.p. Brown; M. Campbell, 3½-h.p. Quadrant; A. B. Drummond, 4-h.p. Werner; D. K. Edwards, 5½-h.p. G.B.; H. S. Freeman, 4½-h.p. machine; S. G. Frost, 3½-h.p. Minerva; O. C. Godfrey, 4-h.p. Werner; E. W. Goslett, 3½-h.p. N.S.U.: C. J. Hart, 5-h.p. Rush; F. Hulbert, 3-h.p. Triumph; H. E. Hull, 4-h.p. Werner; A. G. Reynolds, 2¾-h.p. Bat; W. A. Sale, 3½-h.p. Quadrant; H. B. Shutes, 3½-h.p. Quadrant; A. J. Sproston, 5-h.p. Videc; M. J. Tuchmann, 3-h.p. Quadrant; S. Webb, 3½-h.p. Quadrant; W. H. Wells, 5-h.p. Vindec; T. Woodman, 5-h.p. Vindec; and A. C. Wright, 6-h.p. Durkopp.

Competitors were also entitled to compete for the Schulte Cup, which is offered for the competitor covering the double journey to Edinburgh and back to London closest to schedule time. Those who had entered for this, started upon their return journey at 12.30 a.m. on Monday morning. The entrants were: Messrs. Webb, Reynolds, Hulbert, L. A. Baddeley, D. S. Baddeley Godfrey, Hart, Bailey, Bellenger, Brice, Shutes, Earp, Stocks, Peckham, Taylor, C. W. Brown, and Platt Betts.

Rochet-Schneider Cup.

LAST year M. Perret secured this trophy for the A.C. de Rhone (who founded the race), and in this year's contest, on June 4th (the third), which took place over the famous Auvergne Circuit, he again secured the trophy. Twelve hundred points are allotted as a maximum, sub-divided as follows: Reliability 300, economy (fuel) 200, economy (water) 100, hill-climbing 200, average speed 200, price (chassis) 200.

There were 22 entries this year, 19 started and 17 finished. Twice round the Gordon-Bennett circuit and once over a shorter route, branching off to the right at Pontgibaud, completed the 300-kiloms. course. The results are tabulated below, and the points gained by each competitor in the three most interesting sections are also given separately. All obtained full points for economy in water, and the differences from maximum in respect of reliability and mean speed were so slight as not to be sufficiently important to record independently. The hill climb was held up La Baraque hill. Both the Dunlop and the Continental tyres scored over this very rough course, as the winner used Continental tyres, while the second and fourth cars—both Bayard-Clements—used Dunlops. Desson, who secured third place with a Rochet-Schneider car—the name car of the race—used the well-known Gaulois tyres.

Place.	Car and Entrant.	Total	Price.		Hill-Climb.			Economy.
		pts.	francs	pts.	m.	s.	pts.	pts.
1	Peugeot (Perret)	1,200	10,300	200	7	36	200	200
2	Bayard-Clement (Guyaile) ...	1,150	13,200	171	7	19	200	173
3	Rochet-Schneider (Desson) ...	1,144	14,000	168	7	22	200	195
4	Bayard-Clement (Bergmann)...	1,133	13,200	171	7	36	200	157
5	Herald (Dubois)	1,125	12,800	175	9	0	160	107
6	Herald (Sorel)	1,107	12,800	175	8	50	170	142
7	Buire (Berthier)	1,096	12,000	183	7	28	200	135
8	Rochet-Schneider (Vitalis) ...	1,095	14,000	168	8	21	180	156
9	Buire (Christie)	1,095	12,000	183	7	43	200	126
10	Rochet-Schneider (Dalban) ...	1,091	14,000	168			—	134
11	Brouhot (De Couet)	1,083	15,000	153	8	2	190	132
12	Buire (Marge)	1,080	12,000	183	7	25	200	108
13	Herald (Arrault)	1,067	12,800	175	8	39	170	105
14	Rochet-Schneider (F. Negrin)	1,049	18,000	123	—		190	139
15	Peugeot (Guinet)	1,001	15,000	153	8	42	160	80
16	Mieusset (Berioux)	987	15,700	146			—	106
17	Pilain (Cotre)	986	15,000	153	7	40	200	102

Fuel Consumption of a 60-h.p. Car.

SOME useful figures will be found in the table which we give herewith, concerning the actual fuel consumption of a 60-h.p. 6-cylinder car, when running under ordinary touring conditions with its full complement of passengers and luggage. These were obtained by Mr. S. F. Edge during a recent run made by him from Boulogne to the South of France and back again. For the purposes of making the table complete, and of rendering it as accurate as possible, we have assumed that an hour was each day occupied for lunch, and on one occasion, in which the run was concluded late at night, we have deducted another hour for dinner. Mr. Edge tells us that plenty of time was taken to look round at the interesting places that were passed through, and that, in fact, the trip was made under quite normal circumstances. Very noticeable are the differences that exist in the fuel consumption each day, and for the most part it would appear as

Day.	From.	Time. a.m.	To.	Time. p.m.	Distance. Miles.	Average Speed. m.p.h.	Fuel Consumption.	
							gals.	m.p.gal.
1	Boulogne	7.55	Étampes	6.35	224	23·2	18	12·4
2	tampes	7.50	Châlon-sur-Saône ...	7.0	224	22·1	23	9·73
3	Châlon-sur-Saône	7.40	Aix-en-Provence	8.5	258	22·6	24	10·75
4	Aix-en-Provence	8.50	Beaulieu	3.20	120	21·8	14	8·57
		Totals	outward journey	—	826	22·5	79	10·45
1	Beaulieu	9.30	Avignon	7.45	167	18	18·8	8·88
2	Avignon	9.0	Dijon	10.15	262	23·3	27·7	9·45
3	Dijon...	9.45	St. Germain	7.15	207	24·3	24·4	8·48
4	St. Germain	9.22	Boulogne	4.0	152	27·0	15·5	9·8
		Totals	return journey	—	788	22·7	86·4	9·12
			Grand totals	—	1,614	22·6	165·4	9·75

though the distance travelled per gallon of petrol tended to increase as the speed increased. On the way back, however, the consumption was almost uniformly greater than on the outward journey. We understand that the total running weight of the car was something like two tons.

The 6-Cylinder *v.* 4-Cylinder Car Trial.

It has now been arranged that the long-talked of Johnson-Deasy trial between a 6-cylinder and a 4-cylinder car of approximately the same size shall take very much the same form as the early reliability trials which were held by the A.C.G.B.I. The intention (at the time of writing) is that on Wednesday of this week the relative silence and freedom from vibration shall be determined during a preliminary run, which will include a certain amount of traffic work through the City. On Thursday, Friday and Saturday there is then to be a run from London to Glasgow, *via* Oxford, Leicester and Carlisle, during which hill-climbing tests will be made on four selected hills, and a speed trial of a flying kilometre or a flying mile is to take place over a private road. Up to this time the trial will be conducted under the official observation of the A.C.G.B.I.

On the following Wednesday, Thursday, Friday and Saturday—the 13th to the 16th—the cars take part in the Scottish Reliability Trial, and from the results recorded in that event the marks for reliability and fuel consumption will be obtained.

Mr. Claude Johnson's car, which is a 30-h.p. 6-cylinder Rolls-Royce, is slightly at a disadvantage in respect of cylinder dimensions, for, with its bore of 100 mm. and stroke of 127 mm., the total piston area is about 4 per cent. less than that of the 30–40-h.p. 4-cylinder Martini (bore 125 mm., stroke 140 mm.). Both vehicles are to carry four passengers, including the drivers, and not only is the total running weight to be the same, but it is intended as far as possible to equalise the windage area by fitting a wind screen or some other equivalent device to one car, if necessary.

The system of marking employed is to give 1,000 marks for reliability, 500 for speed, 500 for hills, 25 for silence, 25 for absence of vibration, 100 for infrequency of changing speed, and a number of marks for fuel consumption which will be determined by multiplying the miles per gallon (over at least 500 miles distance), by 4. One hour will be allowed each night in the garage for replenishing and cleaning, but otherwise all delays, whether on the road or for replacements and adjustments in the garage, will involve the loss of 10 "reliability" marks for each minute. The 500 "speed" marks will be awarded to the faster car, while the other vehicle will have the same number, less 10 marks for every second that it proves to be slower on an average. Two runs over the level road will be made each way, and the average time will be used as the basis for marking. Similarly, the same system will be adopted in the four hill-climbing events, but in this case only 5 marks per second will be deducted, in accordance with the mean times for the four hills.

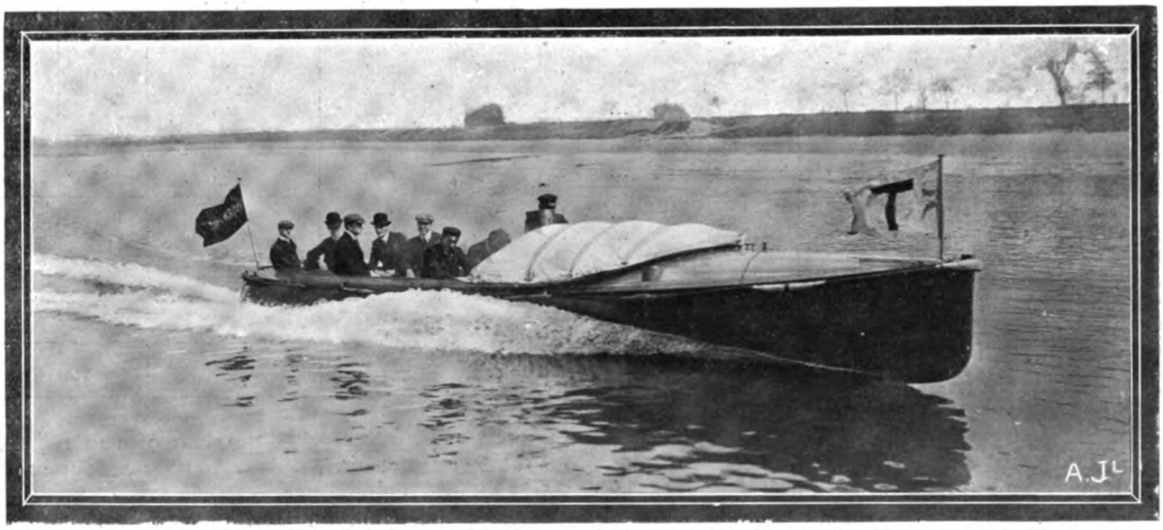
At the same time that the hill-climbing is in progress, a determination will be made concerning the necessity for changing speed, this being done by deducting 5 marks from the 100 above mentioned for each time that a change of gear is made. Needless to say the marks for silence and for absence of vibration will be somewhat empirical, for the quieter car will get 25 marks, and the one which is freest from vibration will get 25 marks, while the other will get a lesser number in each case, according to the valuation made by the umpires.

Such, then, are the carefully-considered rules which have been agreed upon mutually by Mr. Claude Johnson and Captain Deasy.

More Hill Climbing in Scotland.

Stirred by the example of an Arrol-Johnston car, and by the more recent exploits of Captain Deasy on his 20-h.p. Martini, the Argyll Company have also entered the lists, and have just concluded a little hill climb of their own with one of the popular 10–12-h.p. 2-cylinder models. With seven up the car proceeded through Glenlea to the head of Loch Striven, where one of the passengers was dropped. From this place the remaining six continued the ascent until the steepest portion of the hill was reached, when two more left the car. The summit was then gained, with four passengers still in the car, without difficulty, and as a further test the car was backed down to a portion of the hill having a gradient of about 1 in 6, up which it was then driven with five passengers on board. The surface was very rough but quite dry, and although no very accurate measurements appear to have been taken, some figures, said to have been obtained by a gradometer at the time when the Arrol-Johnston car climbed this hill, give the slope as being no less than 1 in $3\frac{3}{4}$.

MOTOR BOATING.



A twin-screw 35-ft. Thornycroft motor boat built for use in Norway. This handy craft has a beam of 5 ft. 9 ins. and draught of 1 ft. 6 ins., and is fitted with a 24-h.p. 4-cylinder Thornycroft motor. She is a fast cruiser, seating twelve to sixteen people. With three passengers she attained an average speed, in six runs, of 21·2 m.p.h. over the measured mile.

Motor Yacht Club Racing.

The first of the fortnightly handicap races for members' boats was held on Saturday last, June 2nd. Five boats were entered, but only three put in an appearance, "Hebe" (Captain Dixon), "Commander" (Commander Mansfield Cumming, R.N.), and "Kathleen" (J. D. Siddeley), a new 30-ft. cruising launch, built by White Bros., and fitted with a 16–20-h.p. Siddeley marine motor. The course was from inside the "Enchantress" to the Calshot lightship, back up Southampton Water to the gas-buoy at the mouth of the Itchen, and finishing at the "Enchantress," a distance of 12 knots. "Hebe" had to allow "Kathleen" 10 mins. and "Commander" 20 mins. 48 secs. "Hebe" crossed the line first, closely followed by "Kathleen" and "Commander" in the order named. "Hebe" was hardly running in her proper form, and only gained about 2 mins. on "Kathleen" during the run out to the lightship. Failing to increase her lead on the return journey, she retired off Hythe, leaving "Kathleen" to finish first. "Commander," though far behind, nearly succeeded in saving her time, passing the finishing line 12 mins. 8 secs. after "Kathleen," or only 80 secs. outside her handicap. The weather was fine, and a number of members witnessed the race from the "Enchantress."

Motor Boat Reliability Trials.

Several modifications have been made in the rules governing the Motor Yacht Club's Reliability Trial for motor boats this year. The more important of them may be summarised as follows:—

1. The trials are restricted to vessels propelled by internal combustion engines.

2. Entrants who declare the selling price of their boats are bound to guarantee duplicates at the same price, if the order is given within a certain time.

3. A more sheltered course than that provided by the lower reaches of Southampton Water will be prepared for use of river boats in the event of exceptionally rough weather.

4. The vessels entered in the cruiser class will be required to cover the combined sheltered and open courses continuously, instead of running for the greater part of the time on the sheltered course only.

5. A reversing and re-starting test has been introduced by means of rule 18.

6. The entries will be classified in accordance with the Marine Motor Association regulation.

7. The apportionment of marks has been considerably modified. In particular, speed has been allotted 100 marks instead of 50, in order to discourage the running of engines considerably below their normal speed, with a view to reducing the risk of loss of marks under the head of "Reliability." "General Condition" has been reduced from 100 to 50 marks. "Economy" has been allotted 30 instead of 20 marks, and the method of awarding marks has been altered. "Efficiency" of reversing arrangement has been allotted 25 instead of 10 marks, and an increase has also been made to the marks now under the heads of "Arrangement," "Ease of Control," and "Silencing." A new heading, "Starting of Engine," for which a maximum of 25 marks is allotted, has been introduced.

8. On each morning of the trials, competitors will be allowed only five minutes instead of ten to prepare and start their engines.

As in previous years, no repairs or adjustments will be permitted on the conclusion of the first day's run.

British Motor Boat Club's Racing.

Oulton Broad was again the scene of a series of races organised by this club on Tuesday, the club's opening meet of the season. Over a five-mile course L. Stroud's "Baby I" came in first for the Brooke Trophy offered for 30-ft. boats, S. W. Humphrey's "Baby II" was second, and F. C. Morgan's "Pelagia" was third. A question of rating has to be settled before the prizes are allocated. A handicap for boats between 18 and 40 ft. was won by "Baby II," with V. D. Wilcock's "Kiama" second, and "Baby I" third, and an open handicap for boats not exceeding 18 feet was won by "Pelagia." All first places were thus secured by Brooke engines.

AERONAUTICS.

The Parseval takes the Air.

THERE is much rejoicing in Berlin that the Parseval airship, a sort of modernised development of the Zeppelin machine, successfully took the air, near Tegel, one day early last week. Great secrecy was preserved about this trial run, and comparatively few people were present when the great airship rose from its moorings and, under very favourable conditions—there was only a wind of five miles an hour blowing, and this is practically a calm—demonstrated that it would, to a certain extent at any rate, answer its helm and proceed at moderate speed through the atmosphere. Its first trip only lasted ten minutes, the crew, amongst whom was Captain Krogh, formerly assistant to Count Zeppelin, who was at the helm, explaining that their nerves were not quite used to this sort of thing as yet. During this trip they rose to a height of 800 feet and the airship landed very nicely. On the second essay she rose to 1,500 feet, and came back to the exact spot from which she had started. It is understood that Major Parseval admits that there are a good many technical defects which require to be rectified. There is a chorus of jubilation throughout the German press at this great triumph of German aeronautics, but considering the performances of the Lebaudy airship the aeronauts on the other side of the Rhine do not seem as yet to have a great deal to be puffed up about. As scouting machines we should decidedly prefer to put our money on the Lebaudy.

The dimensions of the machine, as our readers will call to mind, are 150 feet in length, and the gas vessel contains 8,000 cubic feet of gas. There is no car, but a square platform, on which a 90-h.p. motor is mounted, which drives the propeller and also a fan, presumably for filling the ballonette. The airship presents something of the appearance of a whale, owing to its being provided with a horizontal tail as well as the ordinary vertical rudder.

The Wellman Expedition.

THE Wellman proposed expedition to the North Pole continues to attract more and more attention as it becomes apparent that a start is actually intended to be made this year. In fact, a pioneer party will start quite shortly to establish the base at Spitzbergen, and to set up wireless telegraphy installations. As we have already informed our readers, Mr. Wellman intends experimenting with the airship and testing its capabilities before actually setting forth for the Pole. Ordinary mortals might have thought that he would have attempted something of this sort in less troublesome climates, until at any rate sufficient experience had been obtained. It appears to many people little short of absurd that a man should attempt to navigate a balloon 600 miles and more to the North Pole when he has never even been as far as M. Santos Dumont in his airship under favourable circumstances. One questionable feature of the arrangements will consist of a drag anchor, which will enable the airship to remain stationary in a 12-miles-an-hour breeze. If the breeze increases in force the airship will drift a little, but the anchor will be always able to take twelve miles an hour off a contrary wind, though twelve miles an hour is after all not likely to count for much in an Arctic gale. Another point to which little or no attention seems to have been given is that of condensation on the surface of the gas-vessel. The amount of moisture so deposited, even in France on the Lebaudy airship, has on occasion rendered ascents nearly impossible. What it is likely to be in the form of condensed vapour and snow, nobody knows, probably not even Mr. Wellman himself. He is trusting to his guide rope to neutralise it. We hope it will.

Miss Godwynne Earle, the latest advocate of balloon trips for brain fag and tired workers. Miss Earle has recently been several long trips in balloons, and is now taking regular short ascents as a means of counteracting the effect of the hard work which she must necessarily go through in her theatrical duties. **Mr. Percival Spencer, under whose guidance she makes the ascents, is also in the balloon car in our photograph.**

* * * *

Automobile Clubs Dissolve.

AT the last general meeting of the Motor Union announcements were officially made that as from March 19th last the Burnley and District Automobile Club was dissolved, and that the Reading Automobile Club had decided to perform "hari-kari" on the 24th of this month.

MOTOR CYCLING.

Land's End to John O'Groats.

FURTHER to the particulars published in THE AUTOMOTOR JOURNAL last week, we now give a full list of entries for the important auto-cycle trial, and a table showing the daily routes, with schedule times of arrival and departure throughout. The judges will inspect the machines and affix the club seal at the Union Hotel, Penzance, on June 10th, and the surviving machines will be examined at Wick on June 17th.

June.	Leave.	Arrive.	min.	max.	Distance. miles.
11	Land's End 8 a.m.	Launceston ...	12 noon	—	79
	Launceston 1.30 p.m	Taunton ...	5 p.m.	7.30 p.m.	73½
12	Taunton ... 8 a.m.	Worcester ...	1.15 p.m.	—	104¼
	Worcester 2.45 p.m.	Warrington ...	7.30 p.m.	11 p.m.	95½
13	Warrington 8 a.m.	Kendal ...	12 noon	—	72¼
	Kendal ...1.30 p.m.	Lockerbie ...	5 p.m.	7.30 p.m.	70½
14	Lockerbie 8 a.m.	Stirling ...	1.15 p.m.	—	87½
	Stirling ...2.45 p.m.	Pitlochry ...	5.30 p.m.	8 p.m.	62
15	Pitlochry 8 a.m.	Inverness ...	12.30 p.m.	—	87¾
	Inverness 2 p.m.	Tain	4.30 p.m.	7 p.m.	46¼
16	Tain ... 8 a.m.	Wick ...	1 p.m.	—	92½
	Wick ...2.30 p.m.	John o' Groats	3.30 p.m.	6 p.m.	18
					889

Maximum speed, 20 m.p.h. Minimum speed, 15 m.p.h.
Luncheon time is allowed for at each mid-day stop.

Entries.

No.	Driver.	Machine.	No. of Cyls.	Bore.	Stroke.	Ignition.
		h.p.				
†1	T. Silver ...	3½ Quadrant ...	1	81	88	A
2	W. W. Harrison	3½ Quadrant ...	1	81	88	A
3	A. Williams	3½ Quadrant ...	1	81	88	A
*4	Basil Crump	4½ Minerva ...	2	70	75	A
5	W. H. Wells	2 Vindec Special	2	75	76	M
6	Tom Woodman	5 Vindec Special	2	75	76	M
*†7	H. G. Cove	2¾ De Dion ...	1	76	76	A
8	O. C. Godfrey	4 Werner ...	2	60	76	A
9	H. E. Blackney	4 Werner ...	2	60	76	A
*†10	E. Barnfather	2¾ Microfarad...	1	74	76	M
*11	P. Clem Campariole	3⅜ Rex ...	1	83	90	A
*†12	H. Goodswin	2 Crownfield ..	1	70	70	A
*†13	M. J. Tuchmann	3 Quadrant ...	1	79	80	A
*14	W. Pratt ...	3 Durkopp ...	1	80	85	M A
*†15	Basil H. Davies	3 Triumph ...	1	78	76	M
*16	J. Tassell ...	3½ Matchless ...	1	80	85	M
*†17	T. Neil Grey	3½ N.S.U. ...	1	80	80	A
*18	E. W. Ashworth	4 Werner ...	2	60	76	A
†19	F. W. Barnes	3½ Zenith Bicar	1	80	80	A
*20	A. S. Henderson	4½ Minerva ...	2	70	75	M
†21	F. Halbert ...	3 Triumph ...	1	78	76	M
†22	S. Bramley Moore	3 Triumph ...	1	78	76	M
23	W. Brough...	3½ Brough ...	1	82	82	A
†24	George Brough	3½ Brough ...	1	70	75	A
*25	H. C. Ebbutt	6 J.A.P. ...	2	70	95	A
*†26	S. E. Pemberton	3 Singer ...	1	79	79	M
*27	J. F. Dixon	3½ Bradbury ...	1	79	86	A
28	R. M. Brice	3½ Browne ...	1	82	90	A
*†29	W. Milnes ...	2¾ Phellon-Moore	1	76	76	M
*30	R. Roberts...	6 Bat ...	2	70	95	A
31	R. Moore ...	3½ Phellon-Moore	1	83	76	M
*32	S. H. B. Harris	3½ Brown ...	1	82	90	M
33	Dan Paterson	5½ N.S.U. ...	2	75	75	M
*34	W. P. Allison	5½ G.B. ...	2	75	80	M
*35	W. G. Brooks	5 Rex	2	76	83	A
*36	Capt. L'Estrange	5 Rex ...	2	76	83	A
*37	J. Hughes	6 Roc ...	2	70	95	M A
*38	C. Wakley ...	5 Vindec Special	2	75	76	M
*†39	S. W. Carty	3½ N.S.U. ...	1	80	80	M A
*†40	H. L. Cooper	3 Triumph ...	1	78	76	M
*41	A. H. Ormerod	3½ F.N. ...	4	48	56	M
*42	S. Browne ...	7 Lurquin-Condert	2	80	80	A
*43	A. W. Browne	7 Lurquin-Condert	2	80	80	A
*†44	D. Poupart...	3 Fafnir ...	1	80	80	A
45	F. E. Cox ..	5½ G.B. ...	2	75	80	M
46	A. F. H. Hotopf	3 G.B. ...	1	80	85	M
*47	G. H. Levick	6 Bat ...	2	70	95	A
*48	F. W. Applebee	3⅜ Rex ...	1	80	90	A
49	W. Hayes ...	5 Rex ...	2	76	82	A
*50	H. Hinds ...	3⅜ Rex ...	1	82	90	A
51	H. S. Ruddle	5 Onaway ...	2	70	80	M
*52	A. Newton ..	4½ Minerva ...	2	70	75	M
*53	C. A. Forbes	3½ Leader ...	1	85	76	A
*54	E. Nelson ...	5 Rex ...	2	76	82	A
*55	S. Wilson	4 N.S.U. ...	2	64	70	M
*56	H. Haddon	3½ May Kelecom	1	85	85	A
*57	A. Clarkson	5½ N.S.U. ...	2	75	75	M
*58	A. G. Peppercorn...	4 Werner ...	2	60	75	A
*59	G. W. Blackaller	3½ Quadrant ...	1	81	88	A
*60	Oscar Oppermann...	3¾ Aster ...	1	80	90	A
*61	E. R. Cartwright	3½ Bradbury ...	1	80	82	A
*62	H. C. Bygrave	3½ Durkopp ...	1	85	85	M A
*63	H. D. Seale	3½ F.N. ...	4	45	57	M
*64	H. R. Dougal	4 Stevens ...	1	88	94	A
*65	A. B. White	4 Roc ...	1	85	85	M
*66	M. Thion ...	3¼ Magnet ...	1	80	—	M
*67	E. Harris ...	4½ Durkopp ...	4	52	60	A
*68	S. S. Hickson	4 C.I.E. ...	1	80	85	A
*69	Alfred Wright	4½ Durkopp ...	4	52	60	A

Passenger Class.

No.	Driver.	Machine.	No. of Cyls.	Bore.	Stroke.	Ignition.
70	Henry G. Priest	6 Quadrant Carette ...	2	79	86	A
71	A. H. Albert	6 Quadrant Carette ...	2	79	86	A
72	J. van Hooydonk	6–7 Phœnix Quadcar...	2	80	80	M
*73	H. Fear ...	4 Ashford ...	1	80	90	A
*74	W. MacLean	9 Riley ...	2	86	90	A
*75	G. H. Seward	11 Invicta ...	2	114	110	A
76	W. Montgomery	5 Montgomery Sociable	2	77	80	A
77	J. Browning	9 Riley ...	2	86	89	A
78	Wilbur Gunn	10 Lagonda ...	2	90	96	A
*79	A. Clifford Earp	9 Singer ...	2	86	89	A
*80	Miss Muriel Hind	9 Singer ..	2	86	89	M A
*81	A. E. Beanes	6 Singer ..	2	80	80	A
82	A. C. Godwin Smith	10 Armadale ...	2	92	102	A
83	R. G. Batchelor	4½ Armadale ...	1	89	100	A
84	E. Burchett	10 Armadale ...	2	92	102	A
85	Harold Bowden	6 Raleighette ...	2	75	80	A
*86	C. A. Ringwood	9 Riley ...	2	86	89	A
*87	C. K. Phillips	9 Singer ...	2	86	89	M A
88	N. Borgwardt	6½ Durkopp Sidecar ...	2	80	85	A
*89	Frank Wilson	4½ Armadale ...	1	89	100	A
*90	A. Nicholson	9 Riley ...	2	86	89	A
91	Eli Clark ...	6 Leader ...	2	70	95	A
*92	Peter Nicholas	9 Eagle ...	1	100	110	A
*93	A. Carpmael	9 Riley ...	2	86	89	A

A = Accumulators. M = Magneto.
* Private owners. † Eligible for Mr. A. J. Wilson's Prize.

New Records at Canning Town.

ON Whit Monday some good motor cycle racing was seen in the matches arranged for the bank holiday at the Canning Town track. The leading attraction was the series of matches between G. A. Barnes, who holds the one hour record, and C. R. Collier, the previous champion. Three distinct races were run off over one, three and five miles, respectively, with the following results:—

One mile.—Collier, 1m. 7⅗s. Won by 20 yards.

Three miles race.—In this Collier got away quickly and led the whole distance, covering the first mile in 1m. 7⅘s. In the second mile Collier's time was 58s., a new record for the flying mile, the total time for the two miles, 2m. 5⅘s., being also a new record. The three miles were covered in 3m. 5s., beating the previous record by 2⅗s.

Five miles race.—Collier had a mishap with his machine in this event in the fifth lap, enabling Barnes thereby to secure the race in 5m. 14⅘s., being 2⅖s. outside record.

Two other items created considerable interest, consisting of a five miles handicap, which was secured by W. W. Genn, in 6m. 25⅗s. (5s. start), and a one hour race for 2¾-h.p. machines, won by H. Colver, whose distance was 47 miles 770 yards.

A Climb up Birdlip Hill.

THE Auto Cycle Club propose organising for August, or early in September, an open competition for motor cycles up this famous hill.

International Motor Cycle Cup Race.

AFTER we had gone to press last week, the Auto-Cycle Club announced that they had found it necessary to postpone the Selection Trials, for the International Cup Race, from Wednesday this week, June 6th, to the following day, Thursday, June 7th.

Tour de France.

THIS trial, organised jointly by the Auto Cycle Club of France and *Les Sports*, concluded on Sunday last, June 3rd, having been in progress since May 22nd, when the competitors set out from Paris to Orleans. Poitiers, Bordeaux, Toulouse, Montpellier, Marseilles, Avignon, Lyon, Besancon, Nancy, Reims, Amiens, formed the successive daily stages by which they were brought back to Paris again on the thirteenth day. Competitors were penalised one point for every minute, or fraction of a minute above thirty seconds, that they were behind the schedule time, for which 30 kiloms. per hour formed the basis. Between Marseilles and Avignon the famous Mount Ventoux is encountered, and the times taken by the competitors were recorded over a distance of 20 kiloms. up this mountain. The following table gives the results of the contest, including the times of those who succeeded in climbing Ventoux.

Machine and Driver.	Total Penalisation.	Mount Ventoux.
CLASS. I.—*Tricars* (13 *starters*).		
		h. m. s.
1. Austral III (Schweitzer)	31	1 21 38⅗
2. Austral I (Barenton)	103	1 53 50⅖
3. Austral II (Giraud)	190	
4. Contal III (Pons)	575	
5. Quentin et Cie (Antonini)	1268	
6. Libellule (Canesse)	1623	
7. Auto-Fauteuil (Millet) ...	3352	
8. J. Ronteix (Ronteix)	6489	
CLASS II.—*Light Motor Cycles* (6 *starters*).		
1. Alcyon III (Contant)	2356	
2. Giorgia Knap (Castagné)	2965	
3. Clement (Dacier)	3195	
4. Alcyon I (René)	4105	
5. Herdtle-Bruneau (Herdtle)... ...	4185	
6. Herdtle-Bruneau (Paquet)	6067	
CLASS III.—*Voiturettes* (4 *starters*).		
1. Vulpes (Barriaux)	0	1 13 38⅖
2. De Dion-Bouton (Pellisson) ..	0	1 20 34⅗
3. Auto-Stand (Pellegrin)	0	1 27 55⅗
4. Fouillaron I (Grillet)	2	
CLASS IV.—*Motor Cycles*, ⅓ *litre cyl. capacity* (7 *starters*).		
1. T.D.F. (Cissac)	0	
2. T.D.F. (Giuppone)...	82	1 37 50⅕
3. Quentin II (Fourchotte)	254	
4. Alcyon (Thomas)	1127	
5. Stimula (Pessé)	2974	

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French Ministry and Alcohol.

IN spite of all the competitions that have been organised to encourage the employment of alcohol for industrial purposes for the propulsion of motor cars, its application to the latter purpose at any rate is still far from extensive. The French Minister of Finance has accordingly arranged for two prizes, one of the value of 20,000 francs for the discovery of a denaturing material more satisfactory than those at present employed, and 50,000 francs for a method of employing alcohol for lighting under the same conditions as paraffin oil can be utilised. One is a little at a loss to understand the latter suggestion, as alcohol is being used with conspicuous success in conjunction with the incandescent mantle to give a better light than can be extracted from paraffin burnt in the ordinary way, and though there are paraffin burners which illuminate incandescent mantles, they are on the whole less effective and more troublesome to manage than the alcohol lamps of the same kind.

The Hon. Mrs. Harbord on her 20-h.p. Rolls-Royce Landaulette. This lady is also the owner of a 30-h.p. 6-cylinder R.R. Car.

CLUBS AND ASSOCIATIONS.

Automobile Association.

THE Annual General Meeting of the Association takes place at the Trocadero Restaurant, on June 19th, at 4 p.m., when Col. W. J. Bosworth will take the chair.

Marine Motor Association.

The following appointments of local measurers are announced :—

1. London and Thames from Dover to Oxford, including Southend, Mr. A. Ratsay, Royal Niger Company, Surrey House, Victoria Embankment, W.C.
2. Burnham-on-Crouch, Mr. John Hawkins, Haybank, Burnham-on-Crouch.
3. Norfolk and Suffolk, including Harwich, Mr. A. Townley Clarkson, Royal Norfolk and Suffolk Yacht Club, Lowestoft.
4. Solent District, Mr. G. Keele, 8, Prospect Place, Southampton.
5. Plymouth and Dartmouth District, Mr. G. F. Watson, 14, Smeaton Terrace, West Hoe, Plymouth.
6. Bristol Channel District, Mr. F. W. Kendal, 81, Plymouth Road, Penarth.
7. Liverpool District and North Wales, Mr. E. H. Smith, Fenwick Chambers, Fenwick Street, Liverpool.
8. Belfast Lough.
9. Firth of Clyde, Mr. John Mackenzie, Sandbank, Holy Loch, Argyllshire.

Motor Union.

NEW life members who have been elected to the Motor Union are: Messrs. Wm. R. Beilby, L Vernon Jones, M.D., and Eustace E. Palmer.

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Milan Gold Medals.

AMONGST firms who have received prominent recognition in connection with their exhibits at the Milan Exhibition are Messrs. A. Darracq and Co. and the Serpollet Company, both of which have secured gold medals for petrol and steam vehicles respectively, whilst the manufacturers of the Metallurgique cars have had the distinction of receiving a "Grand Prix."

THE "ARGYLL" TEACHING INSTITUTION IN LONDON.

One Course for Owners and another Course for Professional Drivers.

THERE are few, if any, subjects of more importance to the development of the automobile industry than the provision of adequate means and machinery for imparting satisfactory and *bona fide* instruction to the ever-growing number of men who aspire to fill the rapidly increasing number of vacancies that the development of the automobile movement is creating. The question is one which concerns the comfort and convenience of car owners practically just as much as it is of importance for the well-being of the wage-earning classes of the community, for the existing dearth of competent drivers who can be relied on to give satisfaction from every point of view, certainly affects prejudicially the growth of the movement. There have been, unfortunately, many bogus teaching institutions (and others which, if not exactly bogus, have been far from ideal), and the harm for which they are responsible is almost incalculable. It is, therefore, with feelings of profound satisfaction that we are in a position to announce that Argylls, London, Limited, have gone very fully into the question and are organising a course of practical training designed for teaching both intending chauffeurs and also owners of cars to become really competent and reliable drivers. The scheme has been chiefly elaborated and brought into a practical form by the energetic and enterprising managing director of the company, Mr. E. H. Watson, and an entirely new department has been opened at the extensive Newman Street premises, where both sound and practical instruction is given and an elaborate series of lectures will be delivered. A feature of the whole course is that the pupil will be permitted to remain a pupil as long as he likes, and until he is thoroughly satisfied of his competence, a concession which is in itself a proof of the *bona fide* desire of the company to really confer an adequate system of training.

Mr. C. W. Higgs has been appointed lecturer and demonstrator, and the series will include lectures on the theory and principle of the petrol engine, and all the various parts of a modern motor car, every detail referred to being elaborately illustrated by a series of diagrams and lantern slides, while the instruction will be rendered absolutely complete by enabling the students to examine the actual parts of the cars under discussion.

The extensive depôt of the Argyll Company at 17, Newman Street, is well known to be one of the most extensive and up-to-date garages in the whole of London, or, for that matter, anywhere else; and here those who avail themselves of the course of instruction will be afforded every opportunity of examining different types of cars which are actually undergoing repairs on the premises, a branch of instruction which will be particularly valuable, as the large staff of mechanics employed for the purpose are provided with every kind of up-to-date appliance and machine. This, of course, is a very different thing from the ordinary types of driving school which have hitherto existed, and any pupil who does not avail himself of these advantages in such a way as to become a motor car expert will obviously only have himself to blame.

Two courses of lectures will be given, one designed for owners and the other for intending drivers, and a copy of the syllabus of the course and the demonstrations will be given to each of the students beforehand. The instruction will be of such a complete character that pupils who are already somewhat familiar with motor car construction can benefit almost as much as those who are entirely ignorant; for as the syllabus will show on what days particular subjects are to be dealt with, those who wish to attend can do so. So thoroughly practical, indeed, is the course to be made that a complete chassis is to be placed in the lecture room, in order that constant reference can be made to it by the students during the delivery of the lectures. A very complete course of instruction will be imparted to all the students on such matters as the starting and stopping of the engine, the controlling of its speed by throttle and ignition, the method of changing from one speed to another, how the brakes are properly to be operated, and the various manipulations required in removing and repairing tyres. A special feature will be made of teaching the necessary adjustments that have to be made in the various parts of the mechanism, and practical hints given regarding temporary repairs—readiness in executing which is often of such supreme importance on the roadside.

What we may call the mechanical course, which we have described above, will be supplemented for all who require it by a course of practical lessons in motor car driving, the pupils being gradually promoted as their competency increases till they can be entrusted with the care of a car in the densest traffic. The fee for the mechanical course is to be £10 10*s*., while if driving lessons are also taken the inclusive fee will be £15 15*s*. The company even contemplate extending their syllabus further by the introduction of evening classes, if there should be a sufficient number of applications to warrant this departure.

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A Warning to Naughty Boys.

THE small boy who formerly used to terrorise motorists by the game of "last across" has apparently found that method of obtaining excitement for himself, and lacerating the nerves of car drivers a little too dangerous. So he has now taken to throwing stones at passing cars. In spite of the conviction of one naughty little boy for this offence recorded in our last issue, the dangerous pastime appears to be still on the increase. At least that is the conclusion to be drawn from the experiences related by several members of the committee of the Motor Union at their Meeting at Birmingham. The committee has accordingly given instructions for a circular letter to be sent to Chief Constables throughout the country drawing attention to the matter, and inviting their co-operation for abating this dangerous practice. The Motor Union is also arranging to circularise the teachers of various schools, requesting them to point out to the children in their charge "the dangers of the stone-throwing habit." We can hardly imagine that there is much need to point out the danger. Even in the infants' class the pupils fully comprehend that. It would be more to the point to explain to the youngsters that they will be vigorously prosecuted, and that they may be even sentenced to receive various strokes of the birch, which is exactly what they ought to have.

OLD AND NEW CHINA.—A one-wheeled Chinese barrow, by which a vast amount of the transport in towns is carried out in the Chinese Empire. The up-to-date motor vehicle is a striking contrast to these methods, as exemplified by Mr. Charles A. Glidden's world-travelled Napier, a portion of which is also seen in the photograph. We are indebted to Mr. Glidden for this photograph, sent us whilst on his travels through the Celestial Empire.

The World's Wanderers.

Mr. and Mrs. Glidden, whom we last left at Saigon in French Cochin China, having (as we have related from time to time) toured upon their present journey through India, Ceylon, Burma and Cochin China, have now arrived at Yokohama, and propose to add the island empire of Japan to their other conquests (per car). Nothing in the whole of his extensive travels—and up to the present the tour has covered 33,600 miles without counting the long distances travelled on board ship—impressed Mr. Glidden more than the first view of Fujiyama towering above the lower mountain ranges that form the background of the celebrated bay, and the superb manner in which that famous waterway opens out in ever increasing beauty as Yokohama and Tokio are approached. Mr. Glidden will doubtless have entertaining and original experiences in " Dai Nippon," where, excepting around the principal towns, the roads are far from ideal, though they are not by any means such quagmires and sloughs of despond as do duty as means of communication in the United States. The future of the automobile in Japan, at the present moment at any rate, is to a large extent handicapped by the condition of the roads in many places. Perhaps Mr. Glidden's tour may do something to popularise the motor car in the land of the chrysanthemum, and then doubtless its progressive people will sooner or later embark on an adequate system of road construction.

Motor Omnibus Combine.

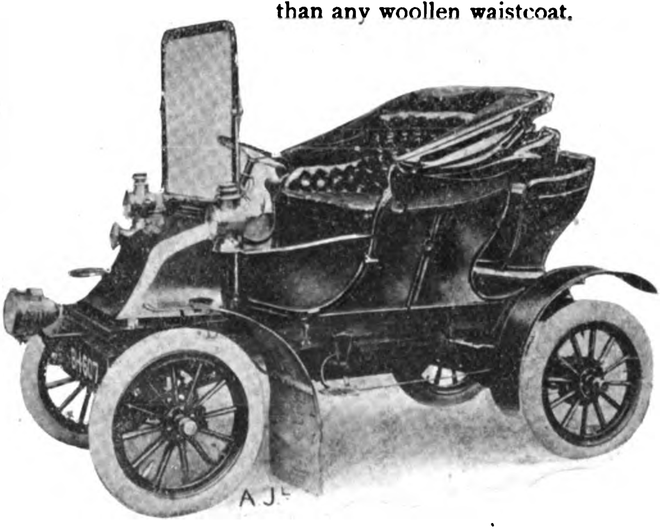
The much talked of combine amongst certain of the omnibus companies, appears as if it were now taking more concrete form. We learn that the preliminaries have been arranged, the leaders in the movement being the London General Omnibus Company and the London Road Car Company.

A "Spare Part" Catalogue.

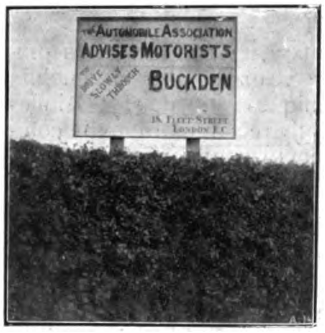
A suggestive commentary on the enormous progress made in the last few years by the automobile industry is provided by the unique catalogue of "Daimler parts" which we have recently received from the company. Almost every single component part of their well-known cars is illustrated on one or other of the pages of reproductions which form the principal illustrations of the catalogue, and a special scheme, which ~~we~~ have not hitherto seen adopted by other companies, is provided for enabling the customer to refer specifically to the precise part for which he may desire to send an order. The pages of illustrations deal with all the main portions of a car. Thus one page is devoted to the change-speed-gear, another to the engine, another to the clutch, &c., &c. On each of these pages will be found, with indicating numbers, all the component parts which make up that portion of the mechanism, and opposite each page of illustrations is a table giving the corresponding reference number to the shop drawings kept in the works, which enables the company to identify the part with absolute certainty. In addition to these important features, the catalogue has useful diagrams and plans showing the position of the various ball bearings on the car, as also the system of wiring adopted for the magneto and for the accumulator ignition.

Paper Waistcoats.

The leather waistcoat, at one time so popular, has now practically gone out of fashion with all excepting professional chauffeurs. The value of a garment of this description, which is impenetrable to the air, however, remains for automobilists quite as important as it was, and many will be pleased to hear that a report has it that a native of Basle, in Switzerland, to wit Herr Schaer, has discovered a process by which paper can be made soft and pliable, and at the same time difficult to tear. From this clothes can be manufactured, and in particular a waistcoat is to be put on the market, at the very moderate cost of twopence, which can be folded up and carried in the pocket, and when worn is said to be warmer than any woollen waistcoat.



An Adams-Hewitt Mail Phaeton recently completed for Dr. J. Owen Harvey, of Wolverton. This little car, which although in general appearance is of the standard 10-h.p. mail phaeton type, made by the Adams Manufacturing Company, has been somewhat varied to meet the requirements of Dr. Harvey, the two chief points being the fitting of side entrance doors and the alteration of the dickey seat behind.



A notice board erected on a piece of land rented by the Automobile Association at the entrance to the village of Buckden in Huntingdonshire, 61 miles from London, on the Great North Road. The A.A. Committee endeavoured to obtain permission to place this signboard at the roadside, undertaking to defray any expenses. This however was refused by the Hunts County Council. It does not therefore appear to be unreasonable to assume that the Hunts County Council fully realise the importance of the profits arising from police traps, and that these have preference over the safety of the villagers.

Motorists' Defence Fund.

DURING the past week the Continental Tyre and Rubber Company (Great Britain), Ltd., have sent twenty-five guineas to the Motor Union Defence Fund. Ten guineas have also been received from the Thames Iron Works Shipbuilding and Engineering Company, Ltd. The thanks of the Motor Union has been conveyed to these firms for their generous assistance to the important legal work which is being carried on by the Union.

Motor Car Dogs.

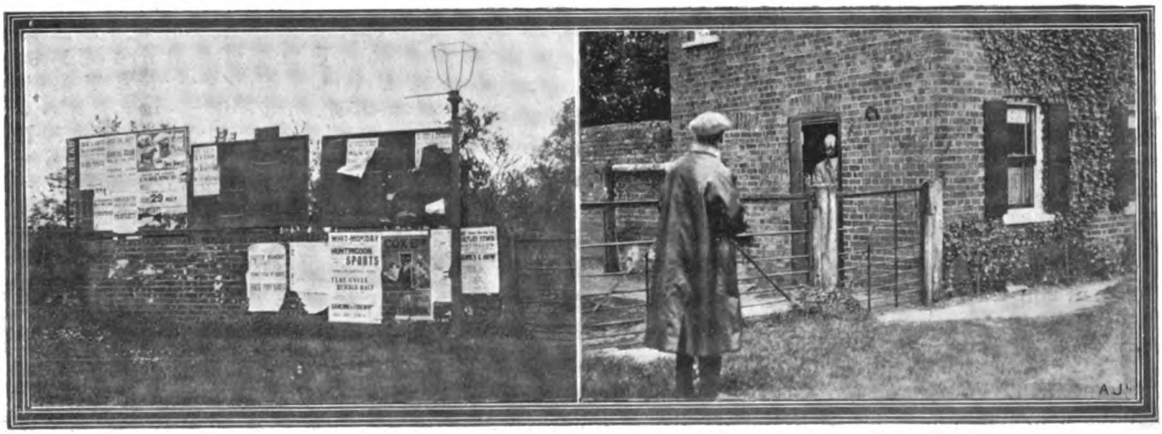
IT will not be long before we see our canine fellow-mortals in all probability advertising for situations as motor dogs—at least, that is a profession to which they are apparently being introduced in Paris. A good sturdy dog to look after the car when the owner leaves it for a few minutes, and keep at a distance the mischievous and fiddling small boy, has been found a very useful servant, and various dogs have been trained for the purpose. To keep them warm they have to be wrapped up in suitable motor coats, and for their convenience they are usually provided with goggles. This disguise does not find favour with all dogs, particularly the fox terrier, who is apparently too much of a dandy to like having his beauty spoiled in this manner. But the Scotch collie, who is apparently without conceit, takes to it kindly, and also apparently enjoys progression at high speed.

The Automobile in Bookland.

MORE and more does the automobile proceed to make its influence felt in the world of letters, or, at any rate, the realm of fiction. Mr. and Mrs. Williamson with their various works we all know, and they have recently added to the list the new motor car novel, entitled "The Car of Destiny." Mr. William Le Queux, whose fame has been almost turned into international notoriety by his lurid descriptions of the terrible things in store for us in 1910, has followed suit with "The Mystery of a Motor Car." The motor car plays a more or less important part in too many present-day novels to be recollected. Amongst these may be noticed books by Mr. Coulson Kernahan and Mr. Lloyd Osborne, while the final *cachet* of up-to-dateness has been conferred on the automobile by the title of a recent novel, "A Motor Car Divorce."

For Motorists' Dusty Clothes.

THE universal dust topic, which, owing to the dry weather, has been exciting everybody, in some cases to the verge of frenzy, has an aspect which non-motorists do not usually bear in mind. Their hedges and their houses on our main roads may be dusty enough, but the clothes of the motorist (and this they will probably learn with equanimity) are dustier still. The "Witch" dust extractor, therefore, should come "as a boon and a blessing" to motor car enthusiasts who are at their wits' end for a really satisfactory method of getting the dust out of their habiliments after a day's run. The machine is based on the same principles as the Vacuum dust extractor for cleaning carpets, but is handy and portable. There is a little double bellows, worked by foot, with a piece of hose-pipe and a nozzle. Working the bellows and running this nozzle over clothes of all descriptions enables the dust to be extracted from them with an effectiveness that no beating or brushing can approach. It is a mere detail to the motorist that an additional advantage of the "Witch" exists. When not employed on the clothes of the motorist it can be applied equally well to cleaning his carpets, and, if he lives in the near neighbourhood of a main road, judging by the general onslaught now proceeding in the papers, this is an advantage which should be fully appreciated.



POLICE MOTOR TRAPPING.—Above we give photographs of a police trap near Buckden. Part of this trap is comprised in the poster-bedecked wall seen in the left photograph, behind which the trapping constable is hidden. In this instance the police are assisted by a gentleman who peeps through a doorway adjacent to the constable's hiding place, and corroborates the statements of the police. Our right-hand photograph shows the individual and his pitch in question, which were discovered by Mr. Stenson Cooke, the A.A. Secretary. The photographs were secured by the Chairman of the Association, Col. W. J. Bosworth.

Railway Company's Motor Cars.

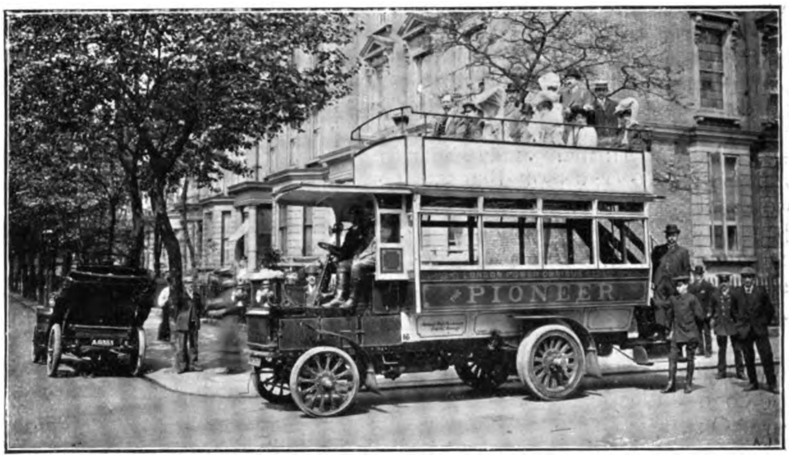
Motor char-à-bancs are being introduced at Scarborough this summer by the North-Eastern Railway Company, and will carry passengers to Forge Valley and other places of interest.

A New Derivation.

The name of that unseen power with whose temptations most of the real enjoyments of life are supposed to be connected, is now believed by some of those who live on the main roads out of London to be a contraction from "Dustevil."

A Straker-Squire Pleasure Car.

Extensions are shortly to be made by Messrs. Sidney Straker and Squire at their new works at Bristol in order to enable them to build pleasure cars as well as commercial vehicles. They have selected as their standard model the well-known car developed in Paris by Messrs. Cornilleau et Sainte-Beuve, and have already secured the British manufacturing rights from that firm. Until their own works are ready, the Straker-Squire cars will be manufactured at the Paris factory, and it is one of these vehicles that has been entered in the forthcoming Scottish Reliability Trial.



GOING TO THE DERBY, 1906.—In addition to the many motor omnibuses which conveyed the public at fixed sums for the day, several of these vehicles were secured for private parties in London. Our photograph shows one of the new "Pioneer" motor 'buses which conveyed Mr. Toubout's party from Cromwell Road to Epsom last week.

The Invasion of Wales.

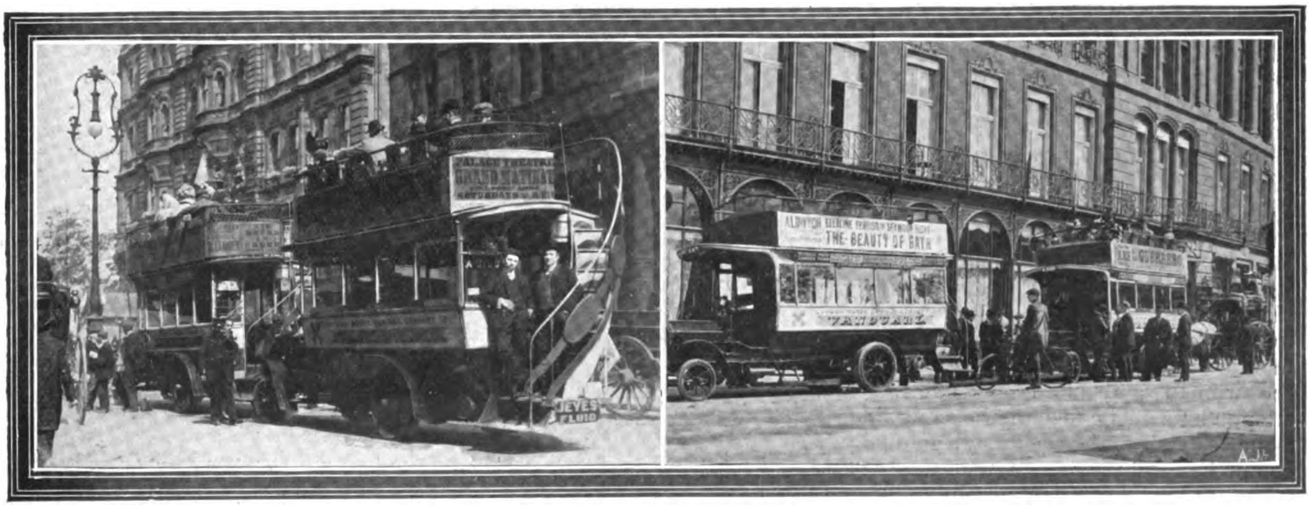
The enterprising Roads Improvement Association is always seeking for fresh fields to conquer and new districts in which to improve the administration and management of our roads. In accordance with this programme, and as the result of many complaints that have been received regarding the condition of the roads in Wales, the Association has had upwards of 1,000 copies of their "Hints to Country Roadmen" printed in the Welsh language and distributed in the Principality. We believe the effect upon the ordinary Welshman of reading something printed in his own language is so marked that he seldom ventures to disobey any injunctions it may convey, and we trust, therefore, that the issue of this pamphlet will not take place in vain.

Hints on Driving.

An adequate little book devoted to the principal pitfalls that lie in the way of the beginner when he commences to take his car out on the road, is a distinct desideratum, and no one possesses the requisite knowledge to write such a work in a more complete degree than Lord Montagu. He has discharged his task very thoroughly in the little treatise, entitled "The Art of Driving a Motor Car," one of the excellent features of which is the number of diagrams and illustrations by which a number of difficult and dangerous positions which are likely to occur on the road are graphically illustrated.

Motor Car Mechanics.

To some extent the book by Mr. Pedley, which is published, like the work referred to above, by the *Car Illustrated*, may be regarded as complementary to the "Art of Driving a Motor Car." It is quite elementary, it must be admitted, though not too elementary, for the reader who has no previous knowledge of motor car construction, and it is lucid and well illustrated, so that altogether the beginner who has taken an interest in automobilism cannot do better than adopt this little volume as his first handbook.



TO THE DERBY BY MOTOR OMNIBUS.—Some of the "Vanguards" off to the Races, starting from Northumberland Avenue (on the left), and De Keyser's Hotel, Thames Embankment (on the right).

Welcome Help.

Mr. Frederic Coleman has generously offered to lend "White" cars for the use of officials in connection with the International Tourist Trophy Race, which is to be held in the Isle of Man on September 27th.

The Argyll Company's Works.

Lord Montagu of Beaulieu will open the new works of the Argyll Company at Alexandria, N.B., on June 26th. This function will, of course, be purely ceremonial, for the works are already in full swing, and are even now employing more than 1,200 men.

A Popular Fashion.

"According to a ladies' paper, it is becoming the practice for brides to return the second butter-dish to the donor and ask that it may be changed for a motor car. One does not hear, however, of the second motor car being changed for a butter dish. And yet people are still found to declare that women have no business instinct."—*Daily Paper.*

A Practical Automobile Dictionary.

To undertake compiling a dictionary of automobile terms in French, German, and English, is an exceedingly thankless task. One gets no thanks for all the synonyms that are correctly given, while someone is sure to find out a mistake some time or other, and to make the most of it. So far, however, we have not seen any dictionary of automobile terms in the three languages so well executed as this one by Mr. Sigmund Kranez (F. Stokes Company, New York). We should not like to say there are no mistakes in it, but we can certainly go the length of stating that the usual mistakes of dictionary makers on this subject are avoided, and that is saying a good deal.

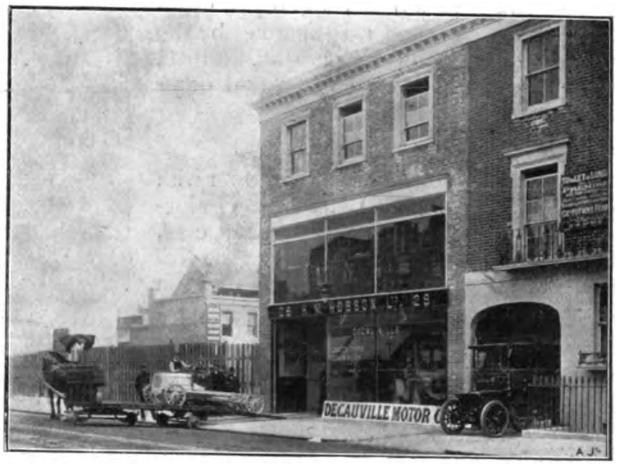
Motor 'Buses for Accrington.

At Accrington a service of motor 'buses, it a announced, is to be run in the district by a local syndicate.

Things Are Not Always What They Seem.

An amusing occurrence took place in Dublin not so very long ago in which the ordinary prejudice of mankind against the motor vehicle was responsible for decidedly ludicrous results. A woman living in a poor quarter of the town found her child in a dangerous condition, owing to immersion in a tub of water, just as a motor car driver was passing. She rushed out, intending to carry the child to a hospital and screaming loudly. The motor car driver picked the two of them up and hurried with them to the house of healing. An intelligent constable, however, jumped to the conclusion that here was another "motor car outrage," and he incited several bicyclists to pursue the car, which, in his opinion, was abducting "the respectable female and her child," while he himself followed, as well as he was able, on an outside car. Ultimately the automobile drew up in front of a hospital, and the woman and child got out to be attended to. The face of the constable, as he arrived on the scene and gradually comprehended the true state of the case, is said to have been a study in multitudinous expression.

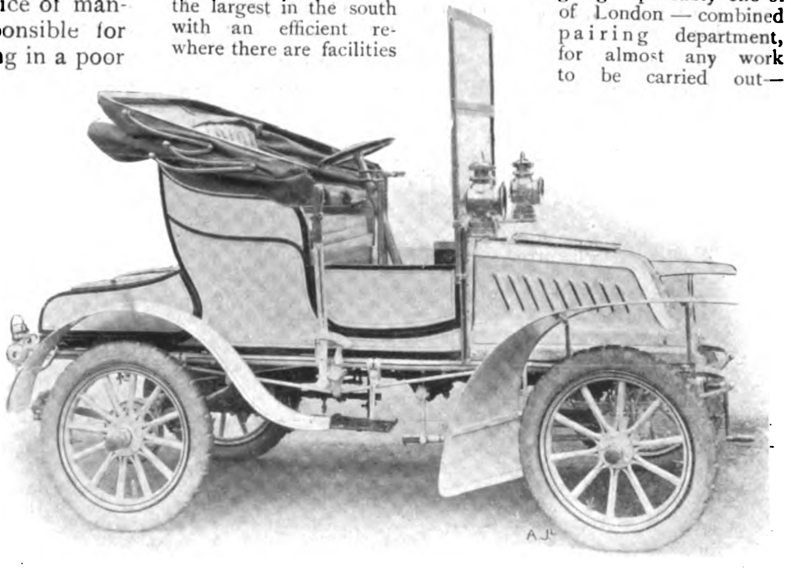
COMMERCIAL POINTS.



The new garage and repair shop of Messrs. H. M. Hobson, Limited, in Vauxhall Bridge Road.

Messrs. H. M. Hobson, Ltd.

The advent of the motor car has been the means of providing an opening in many directions, for the latent enterprise of individuals who, by early grasping the enormous future in store for mechanical traction, and entering the business in a whole-hearted, although careful spirit, have secured a valuable following, and thereby been enabled to establish a permanent and ever growing business. Such a one is well exemplified in Messrs. H. M. Hobson, Ltd., who originally started in the cycle business in the City. In 1896, when the Motor Car Act was passed, they speedily grasped its importance, and after trying their luck with motor bicycles, soon passed into the car trade, Mr. Hobson being fortunate in securing as a purchaser of their first car no less a personage than the Sultan of Morocco. The firm, soon after having outgrown their premises, removed to King's Road, Chelsea, with works at Wimbledon. After absorbing the next-door house, a few months found them more cramped for space than ever, owing to the rapid increase in their trade. It was then decided to make a move which it is anticipated will meet their requirements for some time. This was to build their own establishment on a suitable site in Vauxhall Bridge Road. Last week the formal inauguration of this new four-storey establishment was held, when the invited guests found a very fine and convenient garage—probably one of the largest in the south of London—combined with an efficient repairing department, where there are facilities for almost any work to be carried out—



The latest pattern 8-h.p. De Dion-Bouton Car, which has just been fitted with a charmingly designed carriage body for Miss Dorothy Levitt. The main colour is white with green mouldings and lines, upholstered in green leather, the tan coloured hood harmonising very effectively in the scheme.

short of building a car—in addition to spacious offices. Here the firm will continue the practice upon which they have built up their reputation of employing a good class of engineer, with three to five years' experience in the motor industry, instead of the youth who, in many garages, undertakes duties for which he is quite unfitted. Messrs. Hobson, Ltd., in addition to holding the agency for Decauville Cars, also handle in this country the well-known Pognon Plugs and the Jenatzy Tyre.

Samson Non-Skids in the Milan Gold Cup.

We learn that the famous Samson tyres were used by Maggioni on the driving-wheels of his Zust car in the race for the Milan Gold Cup. This Italian model, as we announced, was classed second, having only been penalised for 7 seconds during the whole period, and having sustained no punctures throughout. The tyres were changed once only, and then as a precaution only, throughout the total distance of 4,000 kiloms. In some cases of other competitors, we understand tyres were changed no less than eleven times. Out of the sixteen cars remaining in at the finish, after the eleven days' run, six were shod with the Samson tyres.

Scottish Reliability Trials.

As will be seen by our advertising columns, the Anglo-American Oil Company have made arrangements for the supply of Pratt's motor spirit to competitors and the general public during the above trials. It is a new departure to publish the names of agents over the entire trials route, and will no doubt be appreciated by those attending the competition.

A Motor Steam Fire Engine Required.

Tenders are invited by the London County Council for a motor steam fire engine for the London Fire Brigade. July 3rd next is the latest date given for sending in tenders.

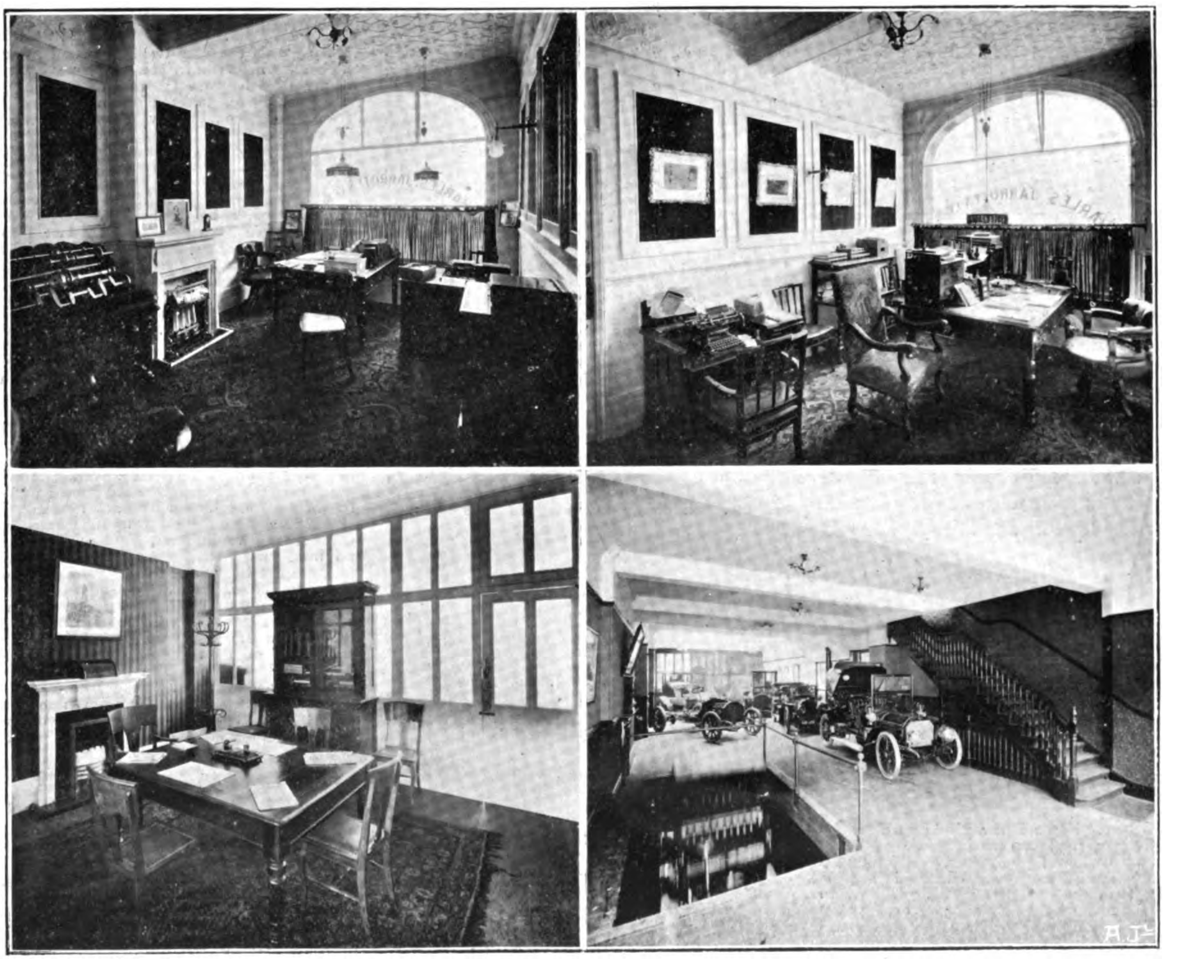
Motiphos is a semi-liquid preparation for application to clutches and brakes when they give trouble by slipping. It soaks into the leather and restores it to a most suitable condition. We have recently given it a trial, and in the worst case three applications were sufficient to remedy a very badly slipping clutch which had been rendered almost useless by previous neglect.

Further useful accessories are now available at that truly excellent stores, the United Motor Industries. In the latest supplementary list just issued, we notice a new motor clock which has a neat electric light arranged above it in order to enable it to be used at night. Motorists who are acquainted with the well-known Empress Jack will be pleased to know that a smaller model for runabouts and voiturettes is now available.

The Standard Motor Agency, Limited, 63, Regent House, Regent Street, W., inform us that they have just concluded arrangements for their representation in Australia, New Zealand, and Tasmania. Contracts have been placed for a term of years for their 6-cylinder cars, and also for the landaulette, which is likely to become very popular in the Antipodes.

Messrs. Oakes and Co., Ltd., hardware merchants and general engineers, of No. 9, Broadway, Madras, write us that they will be glad to receive catalogues with prices and discounts of motor cars, bicycles, tricars, lamps, and accessories. If in a position to grant agencies for Madras Presidency, it should be stated.

The Continental Tyre Company have now over 250 stocks of tyres distributed over the country, and stockholders can be easily recognised by the blue-and-white enamel plate hanging outside. Road signs have also been placed on some of the principal country roads, indicating the name and address of the nearest stockholder.



Most of the leading firms in the automobile business have found it necessary, from the very high-class nature of their business, to provide superior accommodation in connection with their showrooms and offices, and to thus render them even more attractive. Recently Messrs. Charles Jarrott and Letts have considerably extended their premises in Great Marlborough Street, and above we reproduce photographs that show some of the improvements which have been effected. In the top pictures are seen the private offices of the heads of the firm, while the lower pictures show the private waiting room and the main showroom respectively.

LAW REPORTS.

London Electrobus Company, Limited.

IN the Chancery Division on May 31st, Mr. Jolly applied for the removal from the register of the London Electrobus Company of the name of a gentleman who had been allotted 50 shares. —Mr. Justice Joyce: Where is Mr. Colefax?—Mr. Jolly said that the company had given notice that it did not intend to appear.—Mr. Justice Joyce: Very well, there will be the usual form of order for the Electrobus Company. They have a form of their own—(laughter).

Before Mr. Justice Buckley, Mr. Martelli moved on behalf of seven applicants to have their names struck off the register of shareholders. Counsel said that the evidence was the same as given on previous occasions.—His Lordship ordered the names of the applicants to be removed, and that their money should be returned.

* * * *

NEW COMPANIES REGISTERED.

Anti-Friction Motor and Engineering Co. (Ltd.).—Capital, £2,000 in £1 shares.

British and French Motors (Ltd.).—Capital, £20,000 in £1 shares. Objects, to acquire the business of a motor engineer carried on by F. W. Jenkins and the undertaking of Kimberley Bearings, Limited. First directors: Lieut.-Colonel G. W. Treble, C.M.G. (chairman), F. W. Jenkins, and B. H. Rolfe.

Carlton Garage (Ltd.).—Capital £2,000 in £1 shares. Object, to take over the business carried on by E. D. Billing, at 5, New Burlington Place, W., as the Carlton Garage. First directors, E. D. Billing (managing director), and J. G. Phillips.

Earl's Court Motor Garage Co. (Ltd.).—Capital, £2,000 in £1 shares.

Euston Motor Co. (Ltd.).—Capital, £10,000 in £1 shares (4,000 preferred ordinary). First directors: A. C. Gibbons and B. S. Rice.

French Motor Accessories Co. (Ltd.).—Capital, £1,000 in £1 shares.

Gregoire Automobiles, Ltd., 6, Great Marlborough Street, W.—Capital, £100 in £1 shares.

Hampshire Motor 'Bus Co. (Ltd.).—Capital, £20,000 in £1 shares. Object, to take over the business of the Aldershot and Farnborough Motor and Cycle Works. First directors, G. C. Waterfield, Captain W. C. Earel, Captain G. A. Riddall, and A. Cannon Snell.

Itala Automobiles (Ltd.), 89, Wigmore Street, W.—Capital, £20,000 in £1 shares. First directors: M. Fabry, H. R. Pope, and L. Whitehouse.

Mackintosh Tyre Co. (Ltd.), Lower Cambridge Street, Manchester.—Capital, £7,500 in £1 shares (2,500 "A" and 5,000 "B"). First directors: M. Adler and A. E. Harris.

Omnials (Ltd.).—Capital, £100 in £1 shares.

Raglan Motor Co. (Ltd.).—Capital, £2,000 in £1 shares.

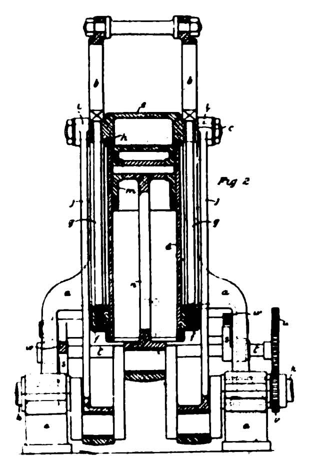
Roto-Motor Syndicate (Ltd.).—Capital, £10,000 in £1 shares. Objects, to acquire rights relating to rotary engines, &c.

* * * *

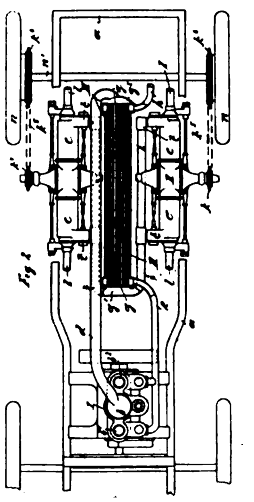
BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

13262. 27th June, 1905. Improvements in Internal Combustion Reciprocating Engines. Alfred H. Crockford, 76, Lowfield Street, Dartford. This invention relates to an improved construction of internal combustion reciprocating engines, with the object of providing a light balanced engine, and of enabling the cylinder to be cooled without the need for gills or water circulation. The cylinders are arranged to move in guides or guideways and are connected by connecting-rods to cranks on the crank-shaft set at 180 dgs., or thereabouts, to the crank connected to the piston; thus the piston and the cylinder both reciprocate and act directly to impart motion to the crank shaft, and their efforts are substantially equal and opposite. The weights of the reciprocating parts are suitably proportioned and are made to balance one another, and the cylinder is made with thin walls to reduce the weight of the reciprocating parts, and to facilitate cooling. There are five figures. Fig. 2 is a vertical central section of the engine on a plane containing the axis of the crank shaft. *a a*, are frame pieces, in which guideways, *b*, are formed to support and guide lugs, *c*, projecting from the cylinder. This cylinder, in order to reduce the weight of the reciprocating parts is preferably built up as shown, and comprises a steel body-portion, *d*, supported between end castings, *e*, *f*. The lugs, *c*, form parts of the casting, *e*. Bolts, *g*, are employed to secure these parts together, and an asbestos or like ring, *h*, is inserted between the end of the body portion, *d*, and the casting, *e*, to make a fluid-tight joint. Extensions of the lugs, *c*, form trunnions, *i*, receiving the ends of connecting-rods, *j*, which, at their other ends, are respectively mounted on the outer crank pins of a crank shaft, *k*, provided with three crank pins. A piston, *m*, and connecting rod, *n*, of ordinary construction are provided, the outer end of the connecting rod, *n*, being coupled to the central crank pin of the shaft, *k*. Combustible gas or vapour is admitted to, and the burnt gases are exhausted from, the cylinder through ports, under the control of valves, the valve chambers being respectively connected through conduits, with supply and exhaust pipes (not shown). These pipes may be flexible or may be made with sliding or other expansion joints, so that the valve chambers can move with the cylinder. The valves are operated by tappets, *s*, keyed on a shaft, *t*, rotated by the crank shaft, *k*, through gear wheels, *u*, *v*, so proportioned that the shaft, *t*, makes one revolution for two revolutions of the shaft, *k*. These tappets act on levers, *w*, arranged to strike pins resting against the ends of valve spindles, which are provided with springs acting to close the valves, *p*.—May 16th, 1906.



22947. 8th November, 1905. Improvements in or relating to the Transmission of Power from Internal Combustion Engines. Wilhelm Maybach, Cannstatt, Würtemberg, Germany. Date under International Convention, 9th November, 1904. This invention is for improvements in or relating to the transmission of power from internal combustion engines and has reference to that type of apparatus in which compressed air, supplied from a suitable compressor, is employed as a power transmitting medium. The object of the invention is to provide a more complete and efficient control of the air-motor than has heretofore been obtainable. There are two figures. Fig. 2 is a plan. The frame, *a*, carries at the forward end the internal combustion engine I, and towards the rear two compressed air-motors II and a heating-chamber III. The air compressor, *b*, is arranged between the two internal combustion cylinders, b^1, b^2, and the piston of the compressor is operatively connected with the engine crank shaft. The air is conducted from the compressor by a pipe, *d*, and enters the head, g^3, of the heating-chamber III. Within the chamber are a series of tubes, *g*, through which the air passes to the opposite head, g^1, whence it is conducted to the compressed-air cylinders, *c*, by conduits, *i*. The pipes, *g*, are heated by the exhaust gases conducted from the internal combustion engine by a conduit, *e*. The gases pass amongst the tubes, *g*, and leave the chamber by an outlet, *h*. The valves, *t*, of the compressed-air motors may be controlled by any convenient mechanism; the exhaust escapes from the outlets, I. In the construction of apparatus shown, driving is effected from the motor shafts, which are independent of each other, by sprocket wheels, k^4, chains, k^5, and sprockets, k^6, mounted on the road wheels, *n*. The wheels, *n*, are free on the fixed axle, n^1. Whilst running on say level ground the air-motors, *c*, may be running synchronously with the internal combustion engine and consequently the air compressor, *b*. The air compressor is then receiving its full charge, and delivering it at normal pressure to the air-motors which immediately absorb it. If now the vehicle commences to take a gradient the additional load will slow up the motors, *c*, and in order that the internal combustion engine may not be overloaded the inlet valves of the compressor are adjusted by suitable mechanism (not shown) so that they close, say at half-suction stroke, and simultaneously the discharge valves are adjusted by suitable mechanism (not shown), so that they remain closed until after the compressor plunger has passed that point of its travel at which the discharge usually takes place. The further advance of the compressor plunger raises the half charge to the normal degree of compression, or even above this, for the purpose of supplying the air motors with the requisite volume of air with a pressure equal to the emergency.—May 16th, 1906.



Patent Specifications Published.

Applied for in 1905.

Published June 7th, 1906.

10,392.	T Parker. Motor vehicles.
10,393.	S. Simpson. Vehicle wheels.
10,409.	L and J. Jackson. Spring wheels.
10,499.	W. T. Smith. Tyres.
10,500.	W. T. Smith. Tyres.
10,545.	H. C. Anstey and C. James. Multi-cylinder intl. combn. engines.
10,546A.	W. Mein. Steering wheels.
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The
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A Record and Review of Applied Automatic Locomotion.

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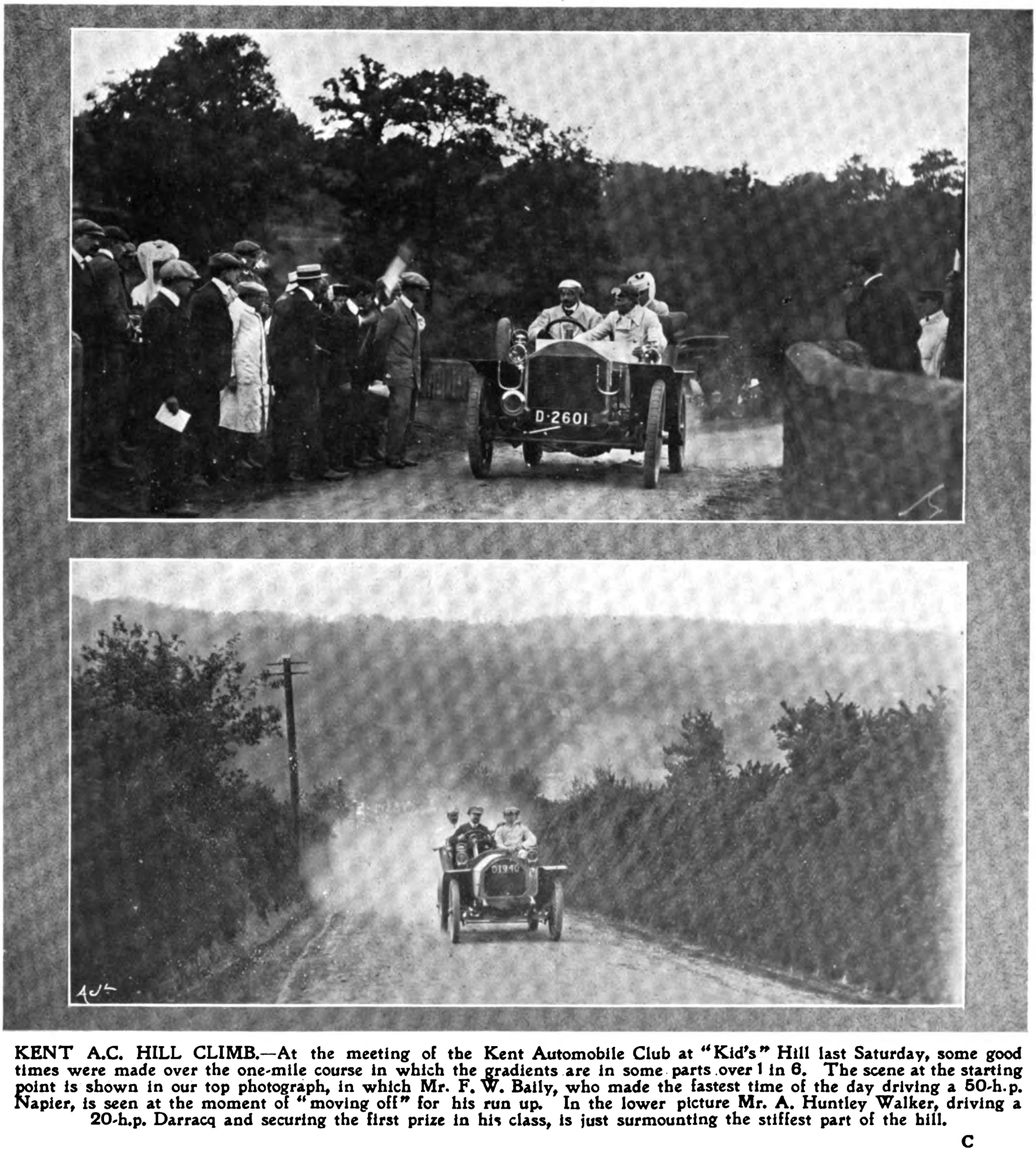

KENT A.C. HILL CLIMB.—At the meeting of the Kent Automobile Club at "Kid's" Hill last Saturday, some good times were made over the one-mile course in which the gradients are in some parts over 1 in 6. The scene at the starting point is shown in our top photograph, in which Mr. F. W. Baily, who made the fastest time of the day driving a 50-h.p. Napier, is seen at the moment of "moving off" for his run up. In the lower picture Mr. A. Huntley Walker, driving a 20-h.p. Darracq and securing the first prize in his class, is just surmounting the stiffest part of the hill.

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DIARY OF FORTHCOMING EVENTS.

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British Events.

June 16 ...	Grindleford Hill Climb (Sheffield A.C.).
June 16 ...	Ragpath Side Hill Climb (N. Eastern A.A.).
June 16 ...	Gymkhana (Essex County A.C.).
June 23 ...	South Harting Hill Climb.
June 23 ...	Du Pré Challenge Cup Hill Climb (Derby A.C.).
June 23 ...	Open Hill Climb (Coventry Motor Club).
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
June 30 ...	Speed Judging Trials (Essex County A.C.).
July ...	Motor Yacht Club Reliability Trials.
July 2 ...	Hill Climb (Wolverhampton A.C.).
July 5 ...	Gymkhana at Wadslay Bridge (Sheffield A.C.).
July 14 ...	Run for Crippled Children (Sheffield A.C.).
July 14 ...	"Henry Edmunds" Hill Climb.
July 21 ...	Motor Union Meeting (Bath).
July 21 ...	Mablethorpe Sand Races (Lincolnshire A.C.).
July 28 ...	Hill Climb (Derby A.C.).
Aug. 6–18 ...	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8 ...	International Cup (Motor Boats) Eliminating Race.
Aug. 9 ...	International Cup (Motor Boat) Race at Ryde.
Sept. 22 ...	Motor Union Meeting (York).
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

June 26–27 ...	Grand Prix (A.C. de F.).
June 28–29 ...	Kiel Motor Boat Races.
July 8 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
July 15 ...	Mont Cenis Climb (Turin A.C.).
July 26–Aug. 15	Circuit Européen.
Aug. 13 ...	Ardennes Circuit.
Aug. 18 ...	Coupe de Liedekerke (Belgium A.C.).
Aug. 26–Sept. 2	Brescia Week (Italian A.C.).
Sept. 10 ...	Florio Cup Race (Italy).
Sept. 15–16 ...	Mont Ventoux Hill-Climb.
Sept. 20 ...	Lake Major Motor Boat Races.
Oct. 5–14 ...	Leipzig Exhibition.
Oct. 6 ...	Vanderbilt Cup Race.

* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

The Proper Attitude to a Difficult Question.

The motor 'bus, owing to the defects of its qualities, has made itself, needless to say, enemies as well as friends, and prominent, if not chief, among its enemies is Mr. Money, M.P., who recently put to Mr. Gladstone in the House of Commons a question in which anti-motor-'busism emerged in almost every expression employed. Mr. Money asked whether :—

> The attention of the Home Secretary had been called to the fact that a number of motor omnibuses had been licensed, in spite of the fact that they were so badly constructed that they constantly broke down, that they frequently carried more passengers than they could hold, and often emitted clouds of noxious vapour, and that, moreover, owing to the terms of employment of drivers and conductors, they were driven recklessly to the public danger, and started while passengers were descending the stairs.

Mr. Gladstone's reply, which was carefully considered and had been put in writing, was that the question of the conditions under which the motor omnibuses might be licensed was one which required *and was receiving* very careful attention. The vehicles, he said, were still in the experimental stage, and though the conditions required for public safety were strenuously enforced, it was rather early, in his view, to require the companies to remedy all the defects. Where there was anything very marked prosecutions had been instituted.

We are glad to find the Home Secretary taking up this sensible and well-considered attitude. Everyone will admit that while fighting the battles of the motor 'bus against its rivals and detractors, we have never been slow to point out what have appeared to us mistakes in the manner in which the 'buses in some cases have been managed, and to insist upon care for the public safety being adequately exercised. But many people are much too readily inclined to run away with the idea that a great development like this must spring perfect upon the public and insusceptible of further improvement. The motor 'bus has proved already such an admirable public servant that a little toleration for its present defects would be only just and fair, and we hope, after Mr. Gladstone's remarks, this attitude may generally become that of the man in the street, and that people when annoyed by smoke and rattle will bear in mind that these troubles will pass away, while the great benefits of rapid transit will remain.

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"Manners Maketh Man."

It is not so very long ago since owners of four-in-hands, particularly if they drove them themselves, as was usually the case, were universally looked upon, and with justice, as well-bred people who observed the courtesies of the road. To Mr. Robert Leonard Powell, "independent gentleman," of Heather Bank, Chislehurst, belongs the proud distinction of having for ever shattered that notion, and it will be owing to him if in future motorists, or for that matter any other people when passing a coach and four, adopt means of protection for their faces and persons. On the 15th of last month Lord Royston was motoring from London to Sevenoaks. He was seated in the back of his car with Miss Heron-Maxwell, daughter of Sir John Heron-Maxwell, Bart. They were proceeding along a perfectly straight piece of road when a coach and four was observed approaching at moderate speed, Mr. Powell handling the ribbons. The motor horn of Lord Royston's car was sounded as a warning, and as the car passed the four-in-hand Mr. Powell leant over and aimed a slashing blow with his coaching whip at Lord Royston's head, most of the effect of which was taken off by the peaked cap by which Lord Royston's head was fortunately protected. The Motor Union, of which Lord Royston is a member, very properly decided to prosecute Mr. Powell; but the ultimate result of the case, which was heard on Monday, can hardly be regarded by anyone but Mr. Powell himself as satisfactory. For this unprovoked and scandalous assault he was let off with a fine of 40*s.* and 10*s.* costs. This is a greal deal more than a joke. Of course we know benches of magistrates are accustomed to deal with a large number of unprovoked attacks on people who have done no harm. They are almost as familiar with such instances as with the "drunks and disorderlies" who form, or did form before the advent of the motor car, the majority of their clients. But magistrates ought to distinguish. If two partially-inebriated tradesmen have a personal difference after closing time, this is the sort of fine that is usually inflicted. Here we have a peer of the realm driving along inoffensively in his own private conveyance, and simply because he meets an individual who happens, by the wonderful dispensation by which this world's goods are distributed, to be driving a four-in-hand, and not to like motor cars, he is subjected to an unprovoked assault and insult of this description. It is not the mere assault. That in itself was, perhaps, trifling. But it is the monstrous indignity of the thing. A hundred years ago an ill-bred person of this kind who adopted such a method of relieving his feelings would have had to face cold steel or the barrel of a pistol the following morning before breakfast, or to have retired altogether from society. The law of assault was intended to prevent these methods of avenging personal affronts; but if it is to be administered in such a manner as this by the infliction of a fine too small for the offender to feel in any way, "Justice's justice" will be brought, if possible, into even greater contempt than it often at present enjoys. Counsel for Lord Royston very properly urged that the offender should be imprisoned without the option of a fine, which, it will be remembered, was the view which even the Guildford Bench took in the case of the Ripley butcher who belaboured Mr. Campbell Muir with a cudgel, and even he finally had to pay a £5 fine and about £100, which his appeal to Quarter Sessions cost him. In such a case as the present, in which the assailant is presumably a person of some education, the punishment, under the circumstances, should be even greater, rather than less. We do not hesitate for a moment to say that the infliction of this ludicrously inadequate penalty is a grave miscarriage of justice and a direct encouragement of persons with whips who happen to dislike automobilists to treat them as Mr. Robert Leonard Powell, of Heather Bank, Chislehurst, treated Lord Royston.

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Twitting Dogberry and Shallow.

Readers of "Brigadier Gerard" and "Uncle Bernac" thoroughly realise what a delightful fund of humour is possessed by Sir A. Conan Doyle, though those who only know him by "Sherlock Holmes" and some of his more serious works may not recognise this side of his genius so readily. It was in full play, however, at the banquet at the Hotel Cecil given on Monday by the High Sheriff of Surrey, in which it fell to Sir A. C. Doyle's part to propose the health of the Surrey county magistrates, in doing which he observed that he felt like a lamb proposing the toast of the wolf (which was doubtless what the lamb was doing when the wolf complained of its drinking at the same stream). County society in Surrey, at any rate as represented by the magistrates, differs, according to the brilliant novelist, from that in most other parts of the country, where, as we all know, it is singularly exclusive and impenetrable. In Surrey, however, if anyone drove a motor car for a week or two in the neighbourhood of Guildford he would be almost certain to receive a most pressing invitation from the county gentlemen (who sit on Saturdays as magistrates in that town), delicately emblazoned on blue paper, and couched in a form that admits of no refusal. Abandoning the humorous standpoint, Sir A. Conan Doyle ventured to hope that a strong chairman of magistrates would some day say that the law should be enforced according to the spirit rather than the letter, and he pointed to the recent large number of fires in Surrey, where some of the most beautiful of one of the few really wild bits of country we have near London had been recently injured by wanton incendiarism, as one of the many ill results that follow from the contemptible tactics of concentrating the police on the high roads to catch motorists, who injure no one (but who bring in fines), and causing them to neglect their duties with such deplorable results. We believe that speeches of this humorous character ultimately penetrate even the pachydermatous cuticles of certain county magistrates, and we hope Sir A. C. Doyle and other people with a similar happy gift will make a practice of delivering more of them.

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The Triumph of the Bath Chair.

It was when Bath rose to pre-eminence as a fashionable resort early in the eighteenth century that the Bath chair was invented, and that picturesque and slightly-comic vehicle has since found its way into all our leading health resorts. The Bath chair existed before the four-in-hand coach. It existed before the old steam cars of the early nineteenth century, and it existed, needless to say, before the railway, and long before the electric tram and motor car, so no Bath chair can reasonably be offended if anybody in a fit of irritation terms it an antiquated conveyance. Nevertheless, this antiquated conveyance has scored a signal triumph over the most modern means of locomotion, the automobile. Some time ago, an application was made by the Town Council of Harrogate to the Local Government Board to have a limit of 10 miles an hour imposed generally throughout the town. There were few arguments in favour of the application. The town possesses fine, broad, straight streets, is modernly built, and never, or hardly ever, suffers from congested traffic. But there is the Bath chair, and it was alleged by the Town Council that the Bath chairs of Harrogate, so justly celebrated in story and romance, would be no longer able to crawl about the streets with the same insouciance as had formerly distinguished them. It is a remarkable sign of the times that the Local Government Board has capitulated, at any rate partially, to the Bath chair, and has decreed a speed limit of 10 miles an hour in nine of the principal streets of Harrogate. After this, let no one say that British officials or the Board of Trade do not adequately appreciate the picturesque and the venerable. If that august department, of which, by the way, it will not be forgotten the Archbishop of Canterbury is, *ex officio*, a leading ornament, requires a new motto. We would suggest for it, "*Vive la Bath chair, à bas l'Automobile!*"

The Conversion of a Duke.

This is not the title of a new novel by Anthony Hope, but it accurately describes the change of mind which we are glad to learn has been undergone by his Grace of Grafton. Once upon a time, it is stated, the Duke registered a solemn vow—we know not exactly for what reason—that never as long as and until, &c., &c., would he enter one of these (various epithets) motor cars. But, like other men before him, the Duke has yielded to temptation. He was anxious to travel to the Exhibition at Kettering as quickly as possible, and without having to wait for trains, and make changes on the journey, and so, forgetful of his solemn vow, he hired a closed automobile. The Duke of Grafton now thinks that "motor cars are the greatest invention ever known . . . and that there is no doubt that for a long journey nothing could be nicer." The conversion of the Duke of Grafton to the new locomotion is all the more remarkable as his Grace is 85 years of age.

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The Modernisation of Egypt.

The mummy of the great Rameses reposes under a glass case in a museum, so he cannot rise from his violated tomb in the rocks at Dendera in surprise at the advent of the automobile into these rocky fastnesses, where the great kings of old are buried. The automobile has found its way there none the less, and is doing admirable service in developing the mines in the neighbourhood of Edfou, a neighbourhood from which came nearly all the washing soda that was used in the ancient world. The twelve miles stage between Bir Abbad and Edfou is covered in forty-five minutes by three light wheeled cars, as compared with three and a quarter hours formerly taken by "trotting" camels—a rate, by the way, which does not say much for the trotting powers of the said camels. The historical incongruity of the appearance of the motor car on this classical spot is, however, far more apparent than real, for the greatest king that was buried there was the most progressive monarch of his day, and would doubtless have welcomed with open arms any substantial improvement in locomotion.

Regular Motor 'Bus Services for Paris.

After a long siege, in which the red tape and inertia of the authorities played their usual *rôle*, the motor 'bus has succeeded in finally gaining a footing, or, perhaps, we should say, a wheeling, in the metropolis on the Seine, and one of the enthusiastic automobile papers across the Channel says that the 11th of June, 1906, on which day the first motor 'bus service in Paris was inaugurated, will be remembered in history as a day of such importance as the 14th of July, 1789, which witnessed the taking of the Bastille. The Paris Omnibus Company has ordered ninety motor 'buses for serving six different routes—from the Hotel de Ville to the Neuilly Gate, the Place St. Michel to Montmartre, the Pigalle to the Halle-aux-Vins, and from the Batignolles Station to the Montparnasse Station. The other two routes have not yet been officially decided upon. The Société des Automobiles Brillié, who are supplying most of the 'buses, gave a regular *fête* in connection with the inauguration of the service, which was attended by a large company, while the general excitement and enthusiasm which prevailed at the introduction of the motor 'bus into Paris, where it is as yet unfamiliar, were remarkable.

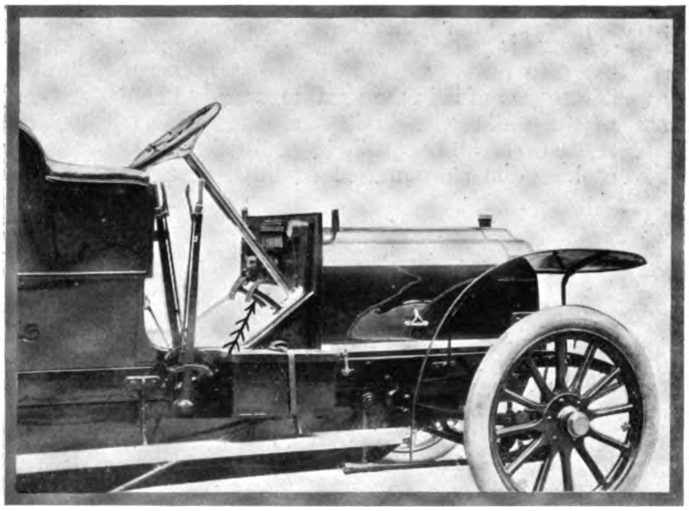
How to Recognise the Cars of To-day.

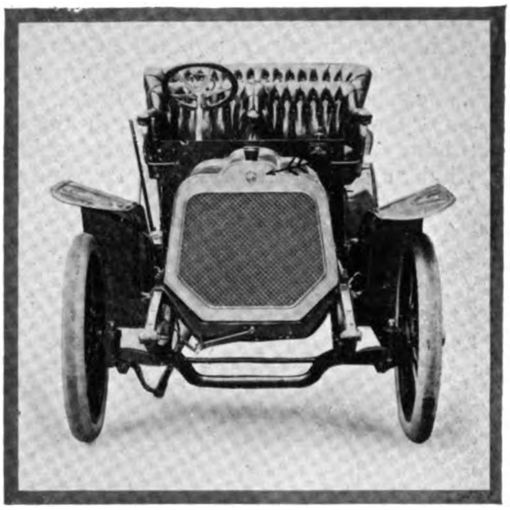
(No. 37.)

The Clement

(FRENCH)

10, 12, 14, 18, 24 & 30 H.P.





A very distinctive type of radiator characterises Clément cars, which can be still further identified by the neat ENAMELLED BADGE, representing the Gallic Cock, mounted just under the water-filler. Another feature is the peculiar foot pedals, which project upwards through the floor board.

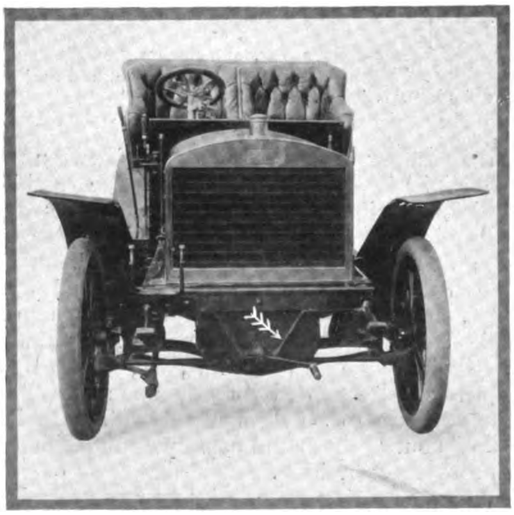
* * *

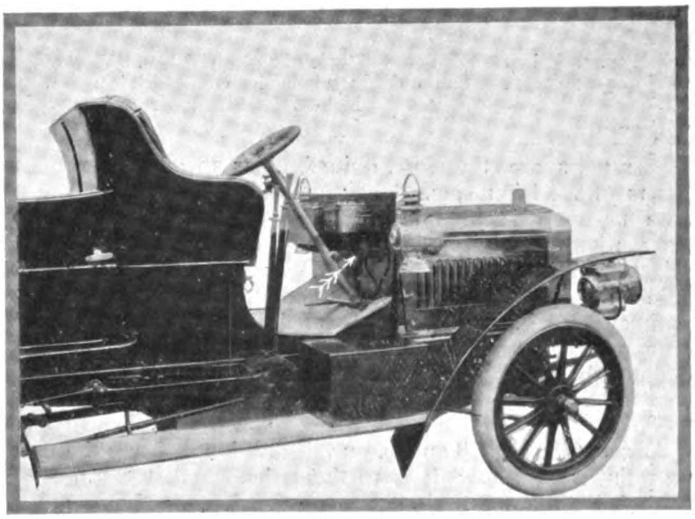
(No. 38.)

The Scout

(BRITISH)

14-16 & 18-20 H.P.





Very WIDE BONNETS are fitted to the Scout cars, but a feature by which they may be easily distinguished is the bracket which carries the starting handle. On the dashboard is a similar bracket for steadying the steering column. Unlike most modern cars the PEDALS on the Scout are arranged to PRESS DOWN instead of push forwards.

HIGH-TENSION MAGNETO IGNITION SYSTEMS.

(Continued from page 132.)

THE DE DION SYSTEM.

ALTHOUGH the apparatus used by Messrs. De Dion in their high-tension magneto ignition system is constructed by Messrs. Bassée-Michel, it differs in several respects from the apparatus, described by us during October and November of last year, which that well-known firm market under their own name. Messrs. De Dion employ two different outfits, one being for their 4-cylinder cars and the other for their 2-cylinder vehicles. In both cases, the system employed is that of a low-tension magneto used in conjunction with a separate induction coil, so constructed that it can also be used with ordinary accumulators when required. Both the high-tension distributor and the low-tension contact-breaker are, in the 4-cylinder system, of the standard De Dion pattern, and these parts are, therefore, quite familiar to all present users of De Dion cars. They are quite separate from the magneto itself, and consequently that machine is particularly simple in its construction. From the electrical point of view, the peculiarity in the 4-cylinder De Dion system is the use of two condensers in the primary circuit, one being connected directly across the armature coil, and the other across the terminals of the contact-breaker. Their effect will be described presently.

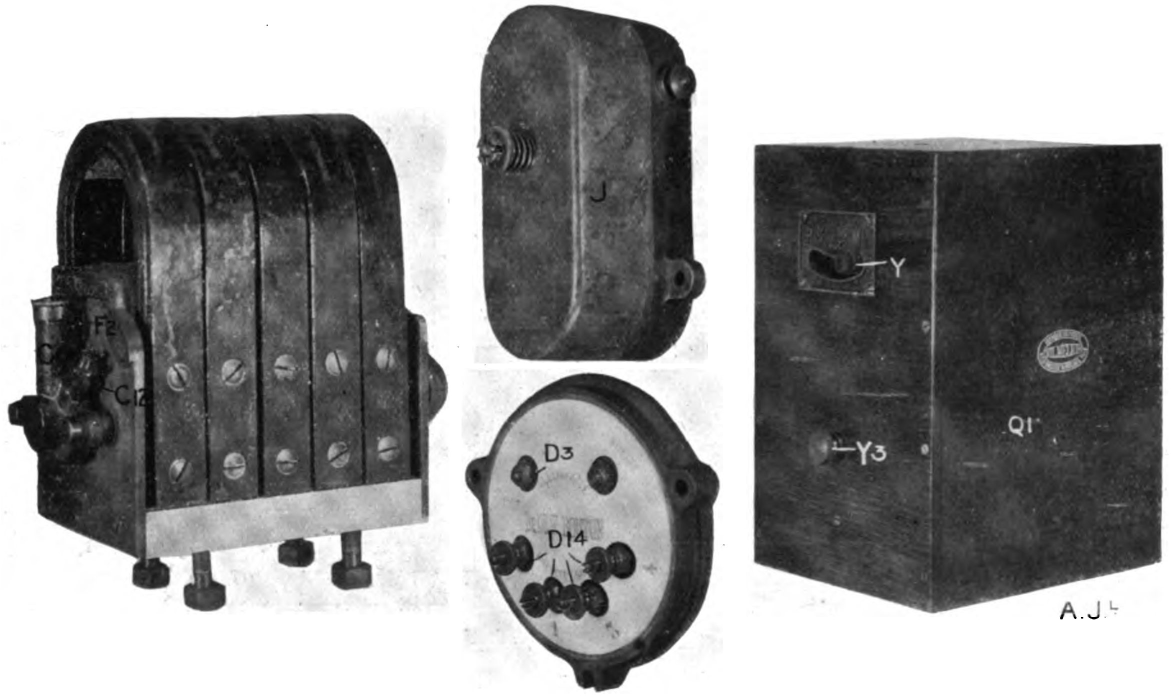


FIG. 1.—The De Dion High-Tension Magneto System. View of the complete outfit for a 4-cylinder car, showing on the left the magneto itself and on the right the induction coil, which is used with it. In the centre are the low-tension contact-breaker and the high-tension distributor, which also form separate units in this system.

Our Illustrations.

Except for Figs. 8 and 9, our illustrations refer to the 4-cylinder outfit, and it is to them that the first part of the following description will refer. A view showing the complete apparatus is given in Fig. 1, and the magneto is shown partly dismantled in Figs. 2 and 3, from which its simplicity will be very apparent. Figs. 4 and 5 show the contact-breaker and the high-tension distributor, respectively, from different points of view, while Figs. 6 and 7 give diagrams showing the electrical connections. Of these latter, Fig. 7 is arranged more especially with a view to helping motorists in making their own connections on the car.

The Magneto.

There is so little of an elaborate character about the magneto itself, that it is unnecessary to subdivide our description of it in the usual manner. The magnets are of the ordinary multiple horse-shoe type, but they are made up of an unusually large number of elements, for each section is composed of three separate pieces and there are five sections abreast. Revolving between the cast-iron pole-pieces is an armature of the familiar shuttle-wound type, illustrated in Fig. 3. It has one end of its winding earthed, and the other is connected through the short spindle, B^1, to the knob, C^1, on its end. Brass plates, M and M^1, which are fitted with ball bearings, support the armature, and the magneto is so arranged on De Dion cars that the armature spindle is driven through the jaw-coupling, B^8, instead of having a gear-wheel mounted directly upon it. This enables the magneto to be dismounted without taking the gear-wheels out of mesh and consequently facilitates replacing in a correct position.

Attached to the bearing plate, M^1, by two screws, is a neat brush-holder, C^6, carrying a carbon brush, C^4, for the purpose of collecting the current from the knob, C^1.

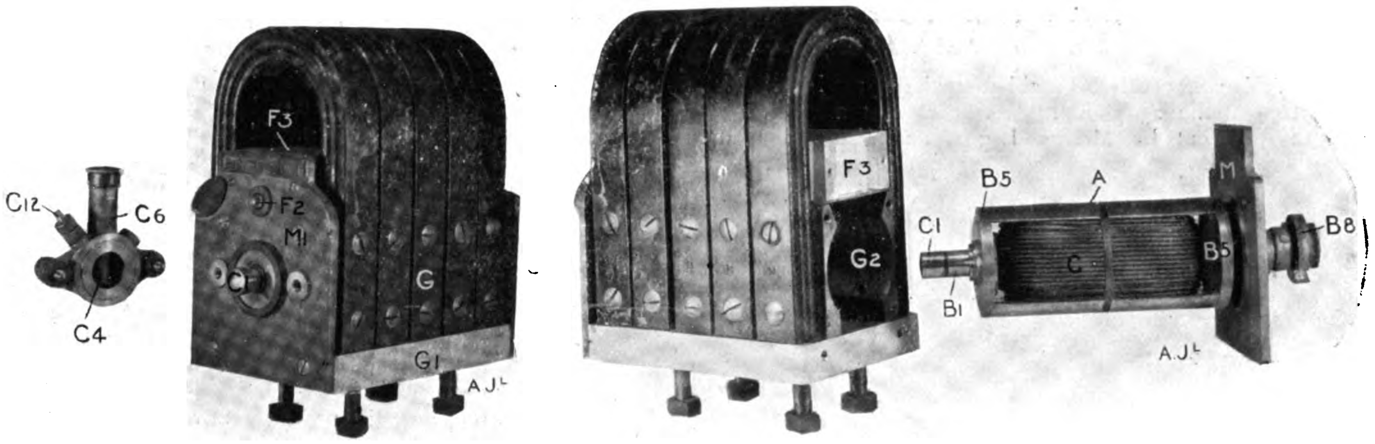


FIG. 2.—The De Dion High-Tension Magneto System. On the left is a view of the magneto, with the brush holder, C^6, removed, in order to show the carbon brush, C^4, and the knob, C^1, from which it collects the low-tension current. On the plate, M^1, is the spring contact, F^2, by which the condenser above the armature is connected to the brush holder, C^6. On the right the magneto is shown partly dismantled, the armature having been withdrawn with one of the bearing plates, M.

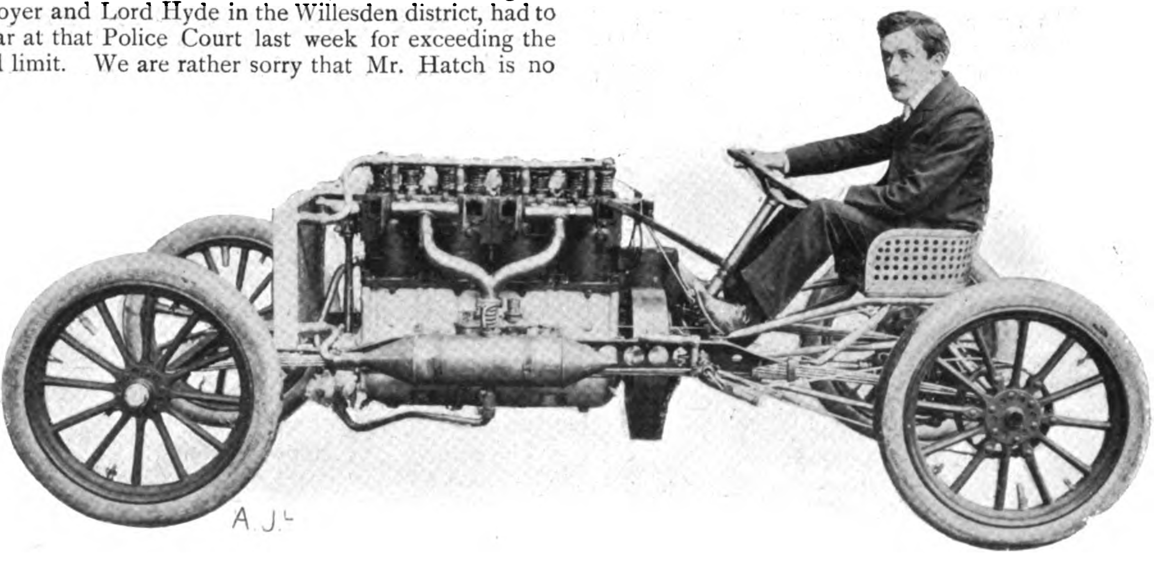
This fitting, C^3, is insulated from actual metallic contact with the plate, M^1, and it is therefore "live." On this fitting, is a terminal, C^{12}, by which it can be connected with a wire to the primary winding of the induction-coil. Immediately above the armature, is a condenser, F, enclosed in an aluminium casing, F^3. It is connected on one side to the brush-holder, C^6, by means of the spring contact F^2, and on the other side it is connected to earth, through its casing which is supported by the magnet poles. In this way, it forms a bridge across the armature winding, its purpose being, as usual, to reduce the impedance of that member and to improve the effect of the induction-coil.

(*To be continued.*)

* * * *

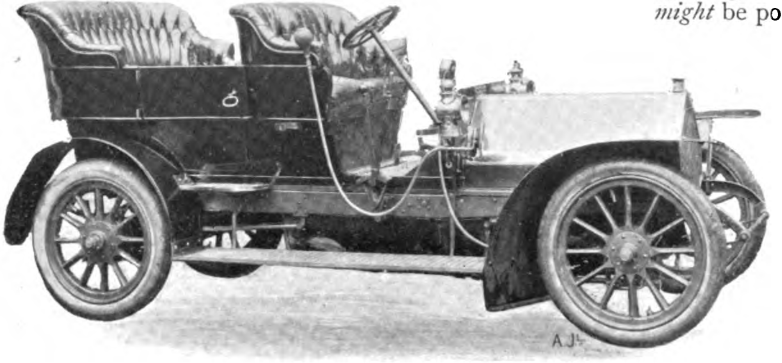
"Hoist with his Own Petard."

IT was Mr. E. F. Hatch, of the last Parliament, but now no longer among our legislators, who, it is said, initiated the speed limit, so that there is a sort of poetic justice in the fact that his chauffeur, who was driving his employer and Lord Hyde in the Willesden district, had to appear at that Police Court last week for exceeding the speed limit. We are rather sorry that Mr. Hatch is no longer a Member of Parliament, as he probably now fully sees the disadvantages of any fixed speed limit, and how much better it would be to rely merely upon the "driving to the danger of the public" clause.



Irrational Car Design.—The above illustration is a striking commentary on the futility of purely racing events as a means of assisting in the development of the modern automobile. Such a machine might well carry all before it in any contest where speed was the only thing striven for, and where no other restriction than that of maximum weight were imposed. This Mendelssohn chassis, with its 50-h.p. Mutel engine, may be summed up briefly as having:—a light perforated steel frame for the engine and clutch only, four leaf springs forming continuations of its side members, a tubular framework for the single spider-seat, a direct propeller-shaft drive to the live axle, and a torpedo-shaped tank on each side of the engine for the fuel and the water. There is also a radiator in front, but there is no bonnet, no dashboard, no exhaust pipes, and——no body. The weight is 400 kilogs. (880 lbs.). Surely it is about time the Tourist Trophy type of race became more universally adopted!

THE LATEST 25-30-H.P. IRIS CARS.



The 25-30-h.p. Iris Car.

WE have recently been able to make a practical trial with one of the 25–30-h.p. "Iris" cars that are now being turned out by Messrs. Legros and Knowles at their Willesden works, and took a good long run on it down into the country. It is, as our readers are aware, a thoroughly well-built vehicle, to the mechanical features of which we devoted a good deal of attention in November last—when it was described in full detail in these columns—but, at that time, we had not had any personal experience with it on the road, and were consequently unable to say anything concerning its capabilities. Since then, moreover, certain structural alterations have been made in its design, and we therefore avail ourselves of this opportunity to supplement, with a few illustrations, the brief mention that we have already made of them.

Giving, in the first place, the impressions which we formed from the trial, we may say without hesitation that we consider it a most delightful vehicle—one which certainly ranks amongst the very highest grades of machine that are now on the market. It is remarkably silent, exceedingly well sprung and comfortable, and is, in addition, exceptionally easy to drive, for not only is the single-lever control of the engine simplicity itself, but we have never handled a car upon which it is easier to change from one "speed" to another. It is not often necessary to do so, however, for although there is never any feeling that the car is under-geared, the "Iris" is a splendid hill-climber. In spite of being pleasantly fast, it is obviously not over geared either, but the fact is that the engine pulls extraordinarily well over a very wide range of speed, and does so without setting up any appreciable vibration. Nobody desiring a first-class car of about this power and size could, in our opinion, do better than acquire one of these all-British vehicles.

Much of the simplicity of control is unquestionably due to the absence of any separate lever for "timing" the ignition, this duty being performed simultaneously with opening and closing the throttle-valve. Doubtless it *might* be possible to obtain a somewhat greater efficiency if there were two levers instead of one above the steering-wheel, but it must be confessed that with a car of this character there is no definite sense when travelling of being at any time really handicapped by the imposition of the double duty on one lever only. It may, moreover, be remarked that much of the facility experienced in changing gear is probably attributable to the multiple-disc clutch which is employed—particularly to the absence of "drag" when de-clutching and to the lightness of the inner member.

One of the chief changes that has been made since these cars were first brought out has been the substitution of a high-tension magneto in place of the battery and dynamo. The magneto is of the Simms-Bosch type and is fixed transversely as seen in Fig. 1, being secured to the front cross-tube that supports the engine. It is driven by spiral gear-wheels from the cam-shaft, and is,

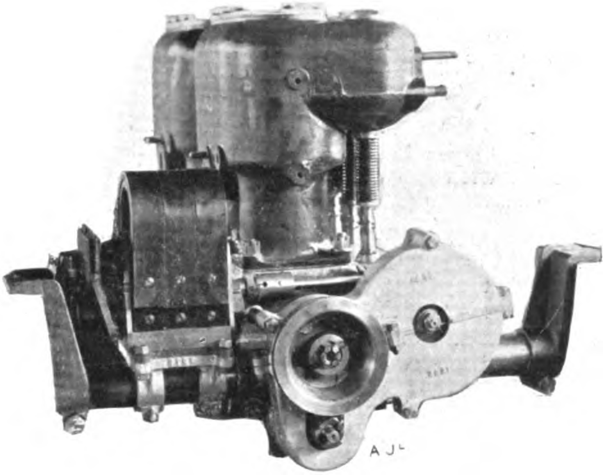


Fig 1.—Front view of the "Iris" Engine, showing the high-tension magneto which is now employed instead of a battery, dynamo, and trembler coil.

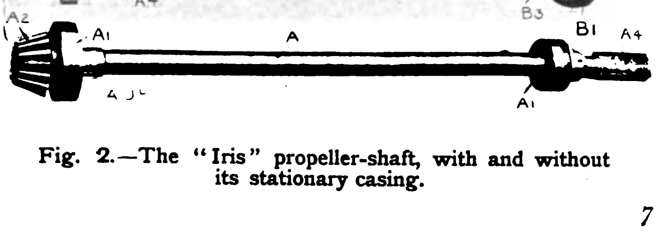


Fig. 2.—The "Iris" propeller-shaft, with and without its stationary casing.

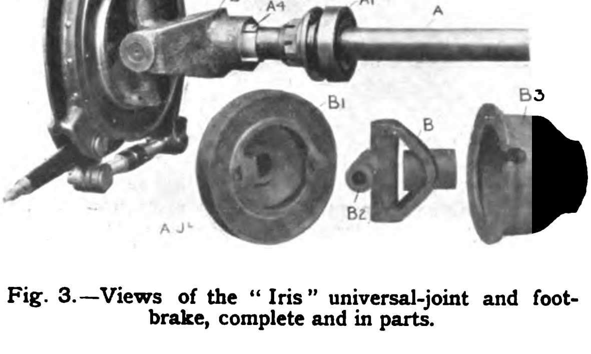


Fig. 3.—Views of the "Iris" universal-joint and foot-brake, complete and in parts.

in fact, in practically the same position that was formerly occupied by the combined commutator and distributor.

Another important modification relates to the propeller-shaft, which no longer has universal joints at both ends, but has one universal joint of an entirely different character. As shown in Figs. 2 and 3, the shaft, A, has ball-bearings, A^1, near each end, and is completely enclosed inside a steel tube, A^3, that is secured by the casting, A^4, to the stationary portion of the live axle. This tube thus acts as a torque-rod, and dispenses with the independent torque-rod that was previously fitted. At its rear end the shaft, A, carries the bevel-pinion, A^2, and at its front end it has three feather keys, A^4, formed solid with it to receive the forked member, B, of the universal joint. No difficulty will be experienced in recognising the other features of this joint, the corresponding fork being formed by the brake-drum, B^1, and the intermediate portion, B^2, being of much the usual form. Protection from dust is afforded by the cover, B^3.

Fig. 3 also shows the foot-operated brake, the shoes of which are carried by the fulcrum-pins, C, these pins in turn being secured to the cross-member of the main frame. On the first "Iris" cars, there were two sets of brakes fitted to the hubs of the road wheels, but one set is now eliminated in favour of the brake illustrated.

* * * *

THE F. AND S. BALL-BEARINGS.

For the past twelve years, Messrs. Fichtel and Sachs, of Schweinfurt, have been devoting their attention to the manufacture of ball-bearings, and they now employ as many as 1,500 men in this work. The steel balls themselves are obtained from a separate factory which has 700 hands, and it has been in existence for no less than eighteen years. It may be fairly asserted, therefore, that the F. and S. bearings, are by no means the production of novices, and indeed, they are already too well known in the automobile industry to need any sort of introduction.

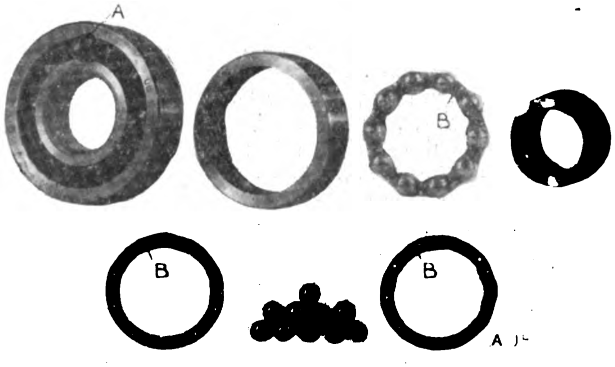


Fig. 1.—The F. and S. Ball Bearing.—Views showing the bearing both complete and in parts. In the upper view, the balls have been replaced in their cage. Beneath, the halves of the cage are shown separately.

The firm's latest type of bearing is illustrated by the accompanying photographs and drawings of a sample which has been submitted to us by Messrs. H. and D. Friedenhain, the London agents, and its peculiarity is the very special type of cage, B, that is employed to separate the balls from one another. This cage is made in halves and consists of two steel stampings, the parts being joined together by small screws. The shape of the retaining cups in this cage is such that the balls themselves support the cage and thus prevent it from rubbing on the races; this point is, it will be noticed, brought out by our illustration, Fig. 1, which depicts a complete bearing, and also a bearing shown with its component parts separately.

The balls are inserted through a notch, A, cut in the wall of each ball-race, but these notches do not interfere with the surface of the race proper, because they stop short of it, and the balls have, in consequence, to be "sprung" into place for the last fraction of an inch when they are being inserted. In order to prevent the screws which fasten two parts of the cage together from becoming loose, their ends are riveted over, but the makers prefer to use screws rather than simple rivets, because they consider that they are able to get a slight adjustment with them and thus to make the cage more satisfactory.

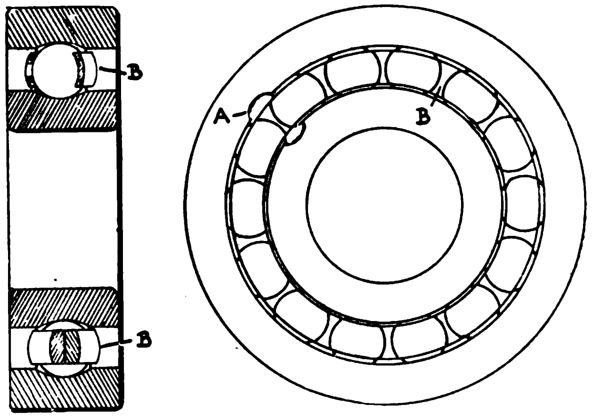


Fig. 2.—The F. and S. Ball Bearing.—Drawing, illustrating the construction of the bearing, and showing the arrangement of the cage.

* * * *

Eton and the Automobile.

A somewhat alarming feature has been added to the usually rather lively proceedings at Eton on the 4th of June. A number of friends and relatives of the boys drove to the college in motor cars, and the great joke was for as many of them as could get the chance to drive these cars up the hill to the castle and back again. That they had no drivers' licences mattered little to them, and presumably the police turned an indulgent eye in an opposite direction. But, after all, the fun was a little bit risky.

"Alice through the Looking Glass" in Real Life.

"Is your licence clean?" said the magistrate to the lady who was arraigned before him on the usual charge (meaning, of course, is it endorsed). "Not very," replied "la belle chauffeuse." "It is somewhat soiled, but it has never been endorsed." "Then I will not endorse it," said the polite (possibly susceptible) magistrate, and the lady went away, quite disappointed that she had not received what she thought was an official decoration.

RACES, RECORDS, AND TRIALS.

KENT A.C. HILL CLIMB.—The competitors and their cars waiting at the foot of the hill for their turn to test their machines.

Kent Hill Climb.

AN interesting meeting took place on Saturday last under the auspices of the Kent Automobile Club, when a hill climb was arranged on Pipingford Hill, known locally as "Kid's" Hill, about three miles from Hartfield, near Crowborough, the foot of the hill being at Coleman Hatch, New Bridge Mill. The gradient is in parts steeper than 1 in 6, and therefore formed a fair test for the cars, which were started from rest over a course of one mile. The weather was conducive to a successful gathering, and a considerable number of members and friends assisted at the function. Mr. W. Willis acted as judge, the timekeepers being Messrs. S. F. Edge, R. Lucas, and Cecil Edge. The stewards were Colonel Latter, Mr. A. Gurney Preston, and Mr. T. H. Nash; whilst the hon. secretary, Mr. Granville M. Kenyon, who originally arranged to act as one of the timekeepers, undertook the functions of starter. The fastest time on the hill was made by Mr. F. W. Baily, on his 50-h.p. Napier, the next best being Mr. Huntley Walker, the winner of Class C, on his 20-h.p. Darracq. The following were the results:—

CLASS A.—*For cars the list price of which does not exceed £200.* Cancelled.

CLASS B.—*For cars the chassis price of which does not exceed £400. (Four passengers)*:—

1. W. F. Bolton, 10–12-h.p. Humber.
2. H. O. Hall, 14–22-h.p. Germain.
3. A. J. McFarland, 12-h.p. Prunel.

Difference in time between the first and second, 14$\frac{2}{5}$ secs.

CLASS C.—*For cars the chassis price of which does not exceed £600. (Four passengers)*:—

1. A. Huntley Walker, 20-h.p. Darracq.
2. T. H. Nash, 20-h.p. Darracq.
3. W. Symmonds, 15-h.p. De Dion.
4. C. B. Gardner, 15-h.p. Panhard.

Difference in time between first and second, 47$\frac{4}{5}$ secs.

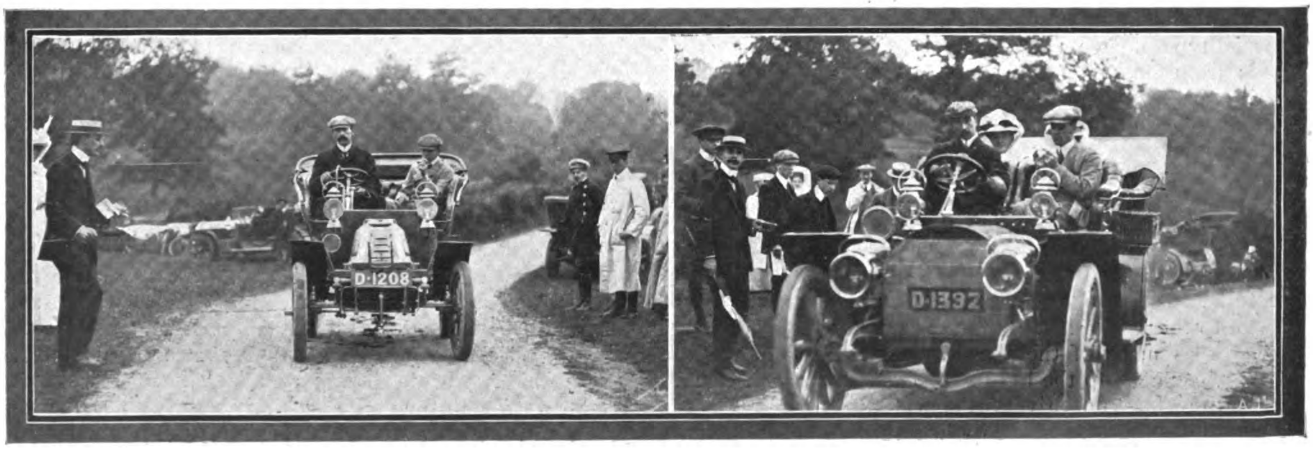
CLASS D.—*For cars the chassis price of which does not exceed £600. (Four passengers)*:—

1. F. W. Baily, 50-h.p. Napier.
2. H. Gardner, 40-h p. Mercedes.
3. A. Huntley Walker, 60-h.p. Mercedes.
4. A. Gurney Preston, 28–32-h.p. Mercedes.
5. H. F. Holman, 20–24-h.p. Martini.

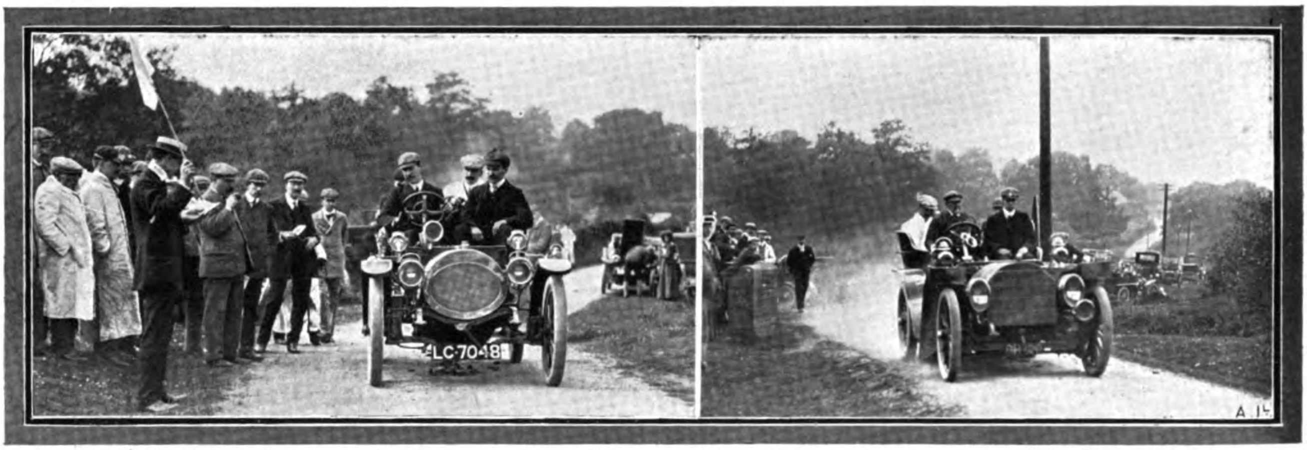
Difference in time between first and second, 40$\frac{4}{5}$ secs.

End to End of Ireland Record.

STARTING at 10 in the morning of June 5th from Mizen Head, driving a 10–12-h.p. 2-cylinder Argyll car, for the purpose of establishing a new record from end to end of Ireland, Mr. W. R. McTaggart reached Fair



KENT A.C. HILL CLIMB.—Two of the competing cars facing the starter. On the left, Mr. W. E. Brewerton's 6-h.p. De Dion. On the right Mr. A. Gurney Preston's 28–32-h.p. Mercedes.



Mr. H. O. Hall on his 14-22-h.p. Germain Car, waiting for the signal to start.

Mr. H. Gardner just started on the climb, on his 40-h.p. Mercedes.

KENT A.C. HILL CLIMB.

Head at 6.55 a.m. on Wednesday morning, June 6. His time of 20 hrs. 55 mins. constitutes a new record and lowers the previous best by 7 hrs. 28 mins. No stoppages were made except voluntary ones, the longest being an hour in Dublin on Tuesday night. The route from Dublin was Balbriggan, Newry, Dundalk, Banbridge, Lurgan, Crumlin, Ballymena, and Ballycastle. The northern roads were good.

The Speedometer Trials—Amended Awards.

IT now appears that the A.C.G.B.I. report on these trials, notifying the awards, was published prematurely in the club organ, and that the order of merit of the various entries was incorrectly given. From the following resolution, passed at the last club committee meeting, it will be seen that the "Jones" Speedometer heads the list as being the most meritorious of the instruments :—

> That the statement referring to the speedometer trials on page 651 of the *Journal* be cancelled and the following substituted therefor :—In view of the fact that the Kirby Speedometer was not in a position to comply with the regulations by being chosen from stock, since it is not as yet on the market, the club is unable to give it an award on the same basis as the others, and, therefore, awards it a special medal as an experimental instrument.

Newgate Street Hill Climb.

THE South Herts A.C. held a Handicap Hill Climb for members on Saturday last at Newgate Street Hill. The hill is situated just outside the boundary of the

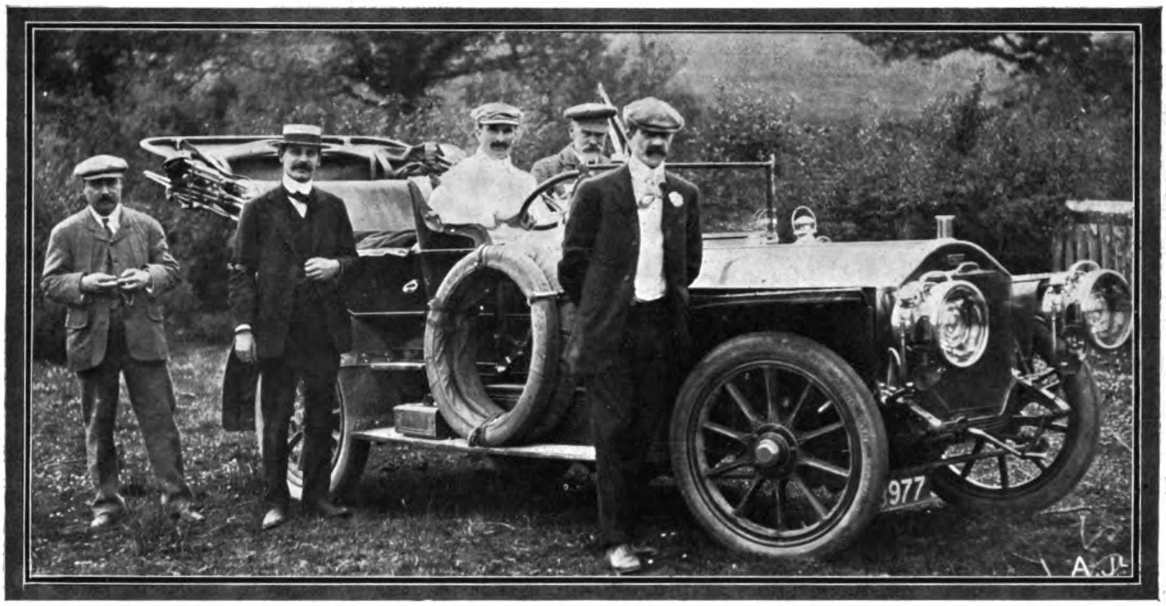
NEWGATE STREET HILL CLIMB RESULTS.

Motor Cycles.

Entrant.	Machine.	Horse-Power.	Cylinders.	Gear.	Weight, in lbs.		Handicap.	Result.
					Machine.	Rider.		
F. Sykes	Rex	5	1	4-1	200	166	9 secs.	1st.
C. E. Fell	Waltham Cross ..	2	1	5¼-1	112	154	20 secs.	2nd
H. W. Spaight	Rex	5-6	2	3½-1	212	154	8½ secs.	3rd
F. W. Foot...	Minerva	4½	2	4½-1	210	164	5 secs.	4
W. E. Hamilton	Waltham Cross ...	5	2	4-1	218	175	scratch	5
E. M. Ridge	Givaudan	4½	2	4-1	200	161	scratch	6

The fastest actual time was accomplished by F. Sykes.

KENT A.C. HILL CLIMB.—Cars returning down the hill to the starting point.



KENT A.C. HILL CLIMB.—Some of the acting officials of the day. Mr. S. F. Edge, one of the timekeepers, at the wheel of his 6-cylinder Napier, by his side Mr. W. Willis, the judge, and standing in front, reading from left to right, are Colonel Latter (steward), Mr. Granville M. Kenyon, the hon. secretary of the Club, who acted as starter for the occasion, and Mr. T. H. Nash (steward).

Metropolitan Police district, and a number of members of that force were present as interested spectators.

The competition was divided into two classes, for motor cycles and motor cars, respectively; the former receiving 17 entries, with 15 starters, and the latter 6 entries, with 5 starters. The handicap was framed by Mr. A. G. Reynolds, the hon. secretary of the Essex Motor Club, whilst Messrs. S. H. Ansell, S. R. Noble, J.P., and J. H. Burley, N.C.U., were responsible for the times.

Newgate Street Hill Climb Results.

Motor Cars.

Entrant.	Name of Car.	H.P.	Cyls.	Weight of		Han-dicap.	Result.
				Car.	Pass.		
				cwt.	stone	secs.	
Mrs. Price .	Star ...	7	2	11	18	40	1st
J. Rochford ...	Wolseley	12	2	18	40	10	2nd
S. R. Noble, J.P.	Rover ...	6	1	6	18	35	3
W. G. Birt ...	Talbot...	12–16	4	15	40	scratch	4
H. E. Honnor ...	Daimler	6½–7	2	15	40	40	5

The fastest actual time was accomplished by Mrs. Price.

The hill was well marshalled under the superintendence of Dr. H. W. Spaight, the hon. secretary of the club, whilst a goodly number of interested spectators lined each side of the road. The chief results are given in our tables.

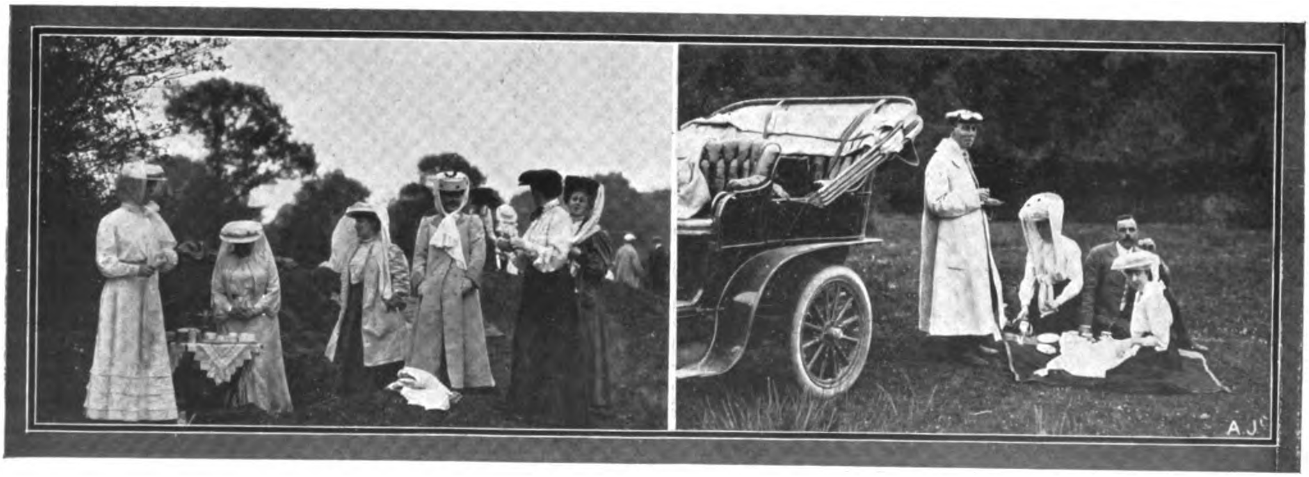
Certificates for driving, irrespective of the times, were awarded to the following:—

Motor Cycles.—E. M. Ridge, W. E. Hamilton, L. W. Foote, H. C. Walsh, F. Sykes, and C. K. Trotter.

Cars.—Mrs. Price and Mr. S. R. Noble, J.P.

Scottish Reliability Trials.

IN our last issue particulars of the 30-h.p. Standard car did not appear in the otherwise complete list of entrants which we then published in tabular form. It is one of the few 6-cylinder cars competing, and will therefore be of especial interest to those who wish for further opportunity of observing the behaviour of this type of vehicle in hilly country. Its engine, which is rated at 30-h.p., has a bore and a stroke of 4 ins., and runs at a normal speed of 1,000 revs. per min. Transmission from the engine to the gear-box is effected through a



KENT A.C. HILL CLIMB.—A welcome interlude for *al fresco* tea.

Kent A.C. Hill Climb.—Col. Latter, who acted as one of the stewards.

metal clutch of the single-disc type. There are four speeds, giving respectively 11, 22, 33 and 44 miles an hour, but the direct drive to the live-rear-axle is provided on the third instead of on the top gear. The wheel base, which is exactly 10 ft., should afford easy riding to the occupants of the comfortable 4-seated body. The track is 4 ft. 6 ins., and the rear wheels are shod with 880 by 120 mm. Continental non-skid tyres, those on the front wheels being 875 by 105 mm. The official number of this car, the price of which complete is £750, is 84 (Class D), and this is the last number in the entire list of entrants.

The 24–32-h.p. Gladiator car bears the official No. 9, while the 40-h.p. Benz, which was one of those to enter after the original list had been closed, is numbered 81.

Since the publication of our table the organisers of the trial have discontinued the use of letters as the distinguishing marks for the various classes, and have adopted figures instead. Thus Class A, according to our table, is now Class 1, Class B is Class 2, and so on. Cars carry number plates bearing both the class number and official number, thus 2–21 indicates Class 2, No. 21.

It has been a source of great regret to many that no "White" steam cars, and indeed no steam cars of any kind, are taking part in these important trials. It is, moreover, a matter which may excite unfair comment unless the reasons for it are understood, because, ever since the White steam car has been on the market, it has always been represented in all the reliability trials that have been held by the A.C G.B.I. or by the A.C. of America.

On this occasion, however, the rules drawn up by the Scottish Club render it impossible for a steam car to obtain full marks for "reliability," however *reliable* it may actually prove itself to be. This is so because only two minutes are allowed each morning for starting up from cold, and any excess of that time involves precisely the same penalty per minute as though such delay were due to breakdown on the road or to failure to complete a day's run within the maximum time that is permitted. No "non-stop" run could therefore be obtained by a car that takes three to five minutes to get under way from the moment that the pilot torch is lighted, even though such a slight delay is of no real moment in practice. Under the circumstances, therefore, the manufacturers of the White steam cars have felt compelled to refrain from competing—a course in which we consider they are fully justified. They not unnaturally at the same time object to the introduction of a separate class for steam cars, deeming it only fair that they should compete in the trial against the same types of car that they ordinarily compete with in the commercial market. To penalise a steam car for *reliability* simply because it requires a possible two or three minutes extra before starting each day, in which to get up steam, is an absurdity.

Mr. Granville M. Kenyon, the hon. secretary of the Kent A.C.

SIX-CYLINDER *V.* FOUR-CYLINDER CAR TRIAL.

BOTH cars reached Glasgow on Saturday last, having duly completed the first stage of the trial under the auspices of the A.C.G.B.I. No official results are, however, as yet available, since the full marks cannot be arrived at until after the four days' runs in the Scottish Reliability Trial are concluded. It may, however, be said that the performances of both vehicles have been excellent, and that, in point of view of speed, both on the level and on hills, they have shown themselves to be very evenly matched. So far as the trial has gone, the results, unofficially, are as follows:—

Hill Climbing.—The Rolls-Royce 6 cylinder won on first two hills, and gained 445 marks. The Martini 4-cylinder won on the last two hills by a considerable margin, and gained 500 marks.

Speed on a Private Track.—The Rolls-Royce won on two trials, one up and one down (491 marks). The Martini won on two trials, one up and one down (500 marks).

Changing Gears During Hill Climbs.— Rolls-Royce awarded 100 marks and the Martini 90 marks.

Fuel Consumption.—Rolls-Royce 46 marks, Martini 55 marks.

Reliability.—The Martini had 30 secs. stop for ignition, and was delayed 38 mins 30 secs. at start of second day owing to failure of pressure to fuel-tank (610 marks). The Rolls-Royce on third day had a stop of 40 secs. to adjust foot-brake (993 marks).

Estimated Totals to Date.—Rolls-Royce 2,075 marks, Martini 1,755 marks.

Silence and *Absence of Vibration* have yet to be judged, and *Reliability* is to be further judged during the Scottish Automobile Club's Trials

In order to render the tests of the respective types of motors of value, it was arranged that the lighter car should carry ballast to make the weights equal. As the 6-cylinder car with body, when ready for the road, weighed under 27 cwt., and the Martini with hood weighed 33 cwt., the Rolls-Royce had to carry ballast of lead and sand to the weight of 2½ cwt. and a fifth passenger and luggage to the extent of a further 2½ cwt. Capt. Deasy loses heavily, it will be noticed, on a delay which has nothing whatever to do with the merits of the 4-cylinder as against the 6-cylinder motor. The piston area of the Martini car is 4 per cent., and piston displacement is 12 per cent. greater than in the case of the Rolls-Royce car.

Kent A.C. Hill Climb.—Mr. A. Gurney Preston, who officiated as steward.

HERKOMER TROPHY.—Prince Henry of Prussia at the wheel of his Benz Car at the moment of being started, in his turn, from Munich for the contest.

HERKOMER MOTOR TROPHY.

Frankfort-on-Maine, Tuesday.

INITIAL PROCEEDINGS.

"We are in the land of barons, and all ready to start for the city of beer," said one of the British competitors as the team of Daimlers that are representing Great Britain in the competition for the Herkomer Motor Trophy drove out of the Landwirtschaftlichen (not to put too fine a point on it!) Halle, after being weighed in, and receiving what Lord Montagu of Beaulieu wittily described as "our insurance against the manufacturing of widows and orphans"—for you must know that the new law in Germany is the finest thing that has yet been drawn up for making motoring impossible, because if the father of a large family becomes poverty-stricken by lack of work, he has only to make up his mind to deliberately commit suicide beneath your car, and you will have to keep his wife, children, mother, grandmother, sisters, sisters-in-law, cousins, and aunts, for as long as they live.

The little brown ticket of insurance against this sort of thing (which each of the competitors are taking such precious care of) is accordingly regarded by them as the most important document of the numerous ones issued in connection with this year's run for the Trophy.

As is generally known, the competition is designed for amateurs, and although the German Club was willing to allow Lancia to figure in that capacity, the peerless Italian is so pleased at having just won the Coppo d'Oro that he is giving the event a go by, and is enjoying a spell of well-deserved rest.

Like the Germans, the Britishers have not been inactive since arriving here; but it is a pity that other engagements have prevented Mr. Charles Jarrott from bringing his Crossley. As it is, we are getting along well enough, with Mr. Julian W. Orde to make things clear between ourselves and the committee. For instance, partly because we did so well with the Daimlers in the speed trials last year, the committee has thought to try and check our progress and that of kindred rivals by instituting a formula that may frankly be pronounced as fair as any that has so far been forthcoming in connection with motor car competitions. The engine capacity has been taken in cubic litres, weight is seemingly considered a constant, and as a result of trials in the Forstenrieder Park and up the Semmering, probably with three cars varying in horse power from medium to high, and having different types of coachwork, two curves have been drawn, each representing vehicles having permanently high body-work, such as limousines. From these diagrams it is possible for every competitor to see precisely how many miles an hour he is expected to do in either test. Whatever his performance lacks of the given numeral will represent marks against him; however many miles an hour he may make over and above the figure returned in connection with his capacity, are to be taken as so many marks in his favour. Now, as the gist of the competition consists of touring reliability at an average speed ranging between 25 and 30 miles an hour for 1,646 kiloms., and as tyres count but little, and there is no special mark for beauty of coachwork, it will be seen that you have literally nothing to do but tour leisurely from one stage to another, saving your car to the best of your ability, and to make two supreme efforts only. One of these is during an 8-kilom. climb up the Semmering, where the third and fourth bends are the only ones that have to be negotiated with extreme care, and the road is so beautifully graded that it presents practically nothing worthy of a name of hard work to an efficient high-powered car. That test occurs midway in the tour, and the other is the flat race at the finish, so that there is every reason to put the least possible strain on the mechanism of your car during the daily runs.

In a competition of this sort, what chances do the British machines stand in relation to their rivals? Well, the Daimlers have always been notable for the amount of power they are able to deliver to the driving wheels from a given engine capacity by means not only of a splendidly-designed motor, but likewise of a transmission-gear that absorbs but little power. As the studies we have been making of the formula reveal more and more that the competition is all in favour of the unusually high-powered car, there is no reason to doubt that the Coventry team is likely to more than hold its own in this matter. This is not merely our own fancy. During the test runs we have been making from Weinheim to the Saalburg in reverse direction over the old Gordon-Bennett course, striking evidence of the care with which these machines are manufactured was afforded by the fact that out of nine cars that were not even thought of eight weeks ago, and which have not been touched in the way of tuning up since they arrived here from Coventry by road, a variation of 3 per cent. was the maximum between the best performance and the worst achieved by any one of the nine 45-h.p. machines, thus proving that the driver is comparatively a negligible quantity if you could only manufacture motor cars in the same manner that you do screws or sewing-machines. This good opinion was confirmed by the members of the combined Automobile Clubs' committee, whom Mr. P. Martin took for a run on the latest Daimlers (the chief features of which were mentioned last week in these columns), for our rivals stated that they consider us opponents who are sure to be in at the finish, and there and then nicknamed us the "Phalanx of Forty-fives."

We have spent this morning in a more or less ill-lit building with a name nearly as large as itself, to wit, the Landwirtschaftliche Halle; have been introduced to our observers; have received insurance tickets against the creation of widows and orphans, as provided for by the beautiful new law to encourage motoring in Germany; have learnt that we start at 5 o'clock in the morning from the third kilometre stone on the Hanau Landstrasse; have scrimmaged under the captaincy of Mr. Julian W. Orde in real Rugger fashion to obtain our guide maps, contour books, name plates, and so forth; have seen Prince Henry of Prussia, in the pink of condition, drive up on his Benz car and go through like formalities with ourselves; have had the honour of our machines being inspected and admired by him; have come to the conclusion the Continental non-skids are the only tyres that have a look in in this competition, there being scarcely a dozen cars without them; and—we are ready to start.

First Day's Run.

Munich, Wednesday night.

No fewer than 133 of the 156 entrants for the second international touring competition for the Trophy, presented by Professor Hubert von Herkomer, R.A., to the Bavarian Automobile Club, left the starting line at Frankfort-on-Maine this morning at 4 o'clock. The weather, which had been overcast here for weeks past, was very fine, for as the day unfolded the promise of morn was spoiled. There are several features that distinguish this competition from that of last year, notable among them being the abolition of compulsory halts *en route*, and the starting of cars according to their power, which order will be observed throughout, no matter how the cars may arrive at the official garage overnight. Other points to be observed are that of the 50 per cent. increase in the entry list this year the majority are obviously amateurs, and quite a number of ladies are being carried as passengers, while the ever-present tyre question has resolved itself into quite an unprecedented rush on Continentals, no fewer than 86 cars being fitted with them, mostly of the new non-skid type. Yet another novel feature of the competition this year is the advantage that has been taken (notably with certain prominent German and Italian cars) of the elimination of special marks for bodywork in the list of awards. Several of these machines were brought to the starting line with canvas flaps, in place of side

HERKOMER TROPHY.—Mrs. Edward Manville arriving on her Daimler Car at Vienna. Note the state of the roads and the mud-covered screen of the car.

doors, to the tonneaus, others were only "finished" in grey paint, while a third variety had coachwork of one colour on a chassis of different hue. Happily a number of these machines were disqualified on inspection, but by a blunder the 90-h.p. Mercedes, handled by the professional, Hieronimus, was inadvertently chalked when brought up for inspection, and as the committee apparently shirked cancelling the action of one of their members, it was decided that it should run, though under the distinct understanding with Mr. J. W. Orde, as representing the A.C.G.B.I., that should it win any prize whatever a strong protest would be entered.

Indeed, the Imperial German, Bavarian, and Austrian Clubs' Committee will have to make drastic alterations if this competition is to attract a large entry list of genuine amateurs in the future. Prince Henry of Prussia is, of course, at the head of all these in the present event, and it may be set on record that though he started 75th, his was among the first dozen cars to arrive in Munich this afternoon, among the others being nearly all the members of the Daimler team, nine of whom are driving the new 45-h.p. models. It was a matter for general condolence that such a good sportsman as Mr. Charles Hardy, the president of the Nottinghamshire A.C., should thus early meet ill-fortune in the shape of a leaky water circulation, on which account he had to withdraw from the competition. As for the other newcomers to this British team, Lord Montagu of Beaulieu, Captain David Hughes Morgan, and Messrs. Arthur Birtwistle, Robert Stotesbury, George Frederick Heublein, A. D. Grigg, and the Cavalier Gino de Martino, each drove splendidly in their own particular styles, while of the veterans, Mrs. Edward Manville and Messrs. Frank Rendle, W. Herdman Ash, and Philip Dawson, handled their respective machines, on behalf of Britain, in a manner that showed they perfectly understood the game they were playing.

While the light mists of early morning still hung along the Valley of the Maine, people lined the way for mile after mile of the somewhat bumpy road, and as we spun along the roads on Capt. D. Hughes Morgan's "45" we often had to travel at 60 miles an hour in order to keep our allotted distance from the car ahead, and so to give no excuse whatever for the adoption of racing tactics on the part of the competitors behind us. The roads were nothing like as well kept as last year, cyclists being frequently encountered travelling towards us, while the flagging was done in a fashion that is in strict conformity with the precedent set by Mr. J. C. Percy's Irishman, who set up the signs immediately over the spots concerning which it was desired to give warning before reaching them. We ran nearly all day with the sun in our faces, having alternate prospects of hills and levels, pine woods and pasture-lands, school children shouting themselves hoarse, and competitors scorching along on cars innocent of silencers, despite the distinct regulations for enforcing the equipment of such essentials for a high-class touring car. As for scorching, it became almost as bad as last year, and has resulted in a fatal accident, whereby the honorary observer on the S.A.G. car, entered by Herr A. Kienle, was killed by its smashing up in taking a corner too fast about five and twenty miles short of Nürnberg. On arrival here to-night, Mr. Orde has not forgotten to drive the lesson home to the officials, and make them insist that the reliability trial pure and simple, which is laid down in the regulations under which the British amateurs have been induced to enter, shall not be turned into ungentlemanly racing. Major Tye put the matter very mildly when he observed, "Some of these fellows are so persistent in chasing you that if you drove your car round a tree to hide it they would follow you all the time."

HERKOMER TROPHY.—Mr. Robertson Grant at Vienna on his Argyll Car.

Second Day's Stage.

Linz, Thursday Night.

Happily there are no mishaps to record in connection with the run from Munich here to-day. As we left the prosperous capital of Bavaria in fine weather there was a cool wind that added to the pleasures of motoring, while the rain overnight had laid the dust splendidly. The peculiar scent of the villages, the blue and white Bavarian colours everywhere, the ornate figures of Christ on the Cross, the tall village poles with the quaint signs of domestic animals and utensils, the minaret and dunce's cap types of church spires, and range after range of snow-capped mountains rendered more beautiful by the tints of blue in the far distant atmosphere, made the drive delightful as the team of Daimlers glided over the roadways at speeds varying from 30 to 60 miles an hour, but always so smoothly and silently that it was impossible to realise that the English legal limit was being exceeded. Indeed, the only incidents to mar our complete enjoyment of the run were those occasioned by the scorching tactics adopted by the Continental cars, whose drivers proceeded from the very starting line with open exhausts. Furthermore, the clouds of blue, black and yellow smoke thus emitted created a temporary fog, that at last became so objectionable to the officials that they may be said to have imbibed wisdom through their noses for having come to the conclusion that next year the regulations must include penalisation for all machines emitting ill odours, smoke, or noises. In this connection it must in justice be pointed out that the British cars are among the very few machines that do not offend against this rule.

On the road from Munich to Linz, at the foot of the Bavarian Alps. Our snapshot was taken by Capt. David Hughes Morgan, whose 45-h.p. Daimler is the main subject of the picture. Capt. Morgan's passengers standing by the side, are Mr. H. Massac Buist, Mr. Percy Martin, and Mr. Albert H. Bush, who are at the **moment enjoying the view at the foot of the Bavarian Alps and over the Chiem See. It was on an islet in this lake that the late mad King of Bavaria built a palace in imitation of Versailles.**

Another snapshot of Capt. Morgan's 45-h.p. Daimler on the road to Linz on the second day's run for the Trophy. Capt. Morgan is standing by the side of the car, and the three heads appearing over the back hood, reading from left to right are, Mr. Percy Martin, general manager of the Daimler Co., Motorman Evans, and Mr. Albert H. **Bush.**

HERKOMER TROPHY.

Some steep hills were encountered to-day, but they were soon overcome, and one of them gave us our first good view of the Chiem See, where stands on an islet the miniature palace, built in imitation of Versailles by the mad King of Bavaria. The country at the foot of the hills of the Bavarian Alps is always beautiful, the very pasture lands being thickly covered with all manner of wild flowers, and the air being resonant with the songs and sounds of many birds and woodland creatures. Towards Salzburg, some of the mountains rose up almost sheer from the roadside and loomed right over us. Here, too, having crossed the Austrian frontier, we had to be careful to bear in mind that we had now to observe the English rules of the road. Again, we had the usual experience of motoring in the region of the Austrian frontier and finding everybody ill-disposed towards the pastime, and shouting "Langsam! Langsam!" even though our cars were merely standing by the roadside with the motors still running. In these regions the natives evidently believe that it is possible to proceed while being stationary! As Lord Frederic Hamilton observed, "They can never hurry in Austria. Here it takes at least three waiters to bring a glass of beer—the underling, the head waiter, and the waiter of the room in which you happen to be eating." Be that as it may, however, there was a good deal of hustling on the part of the competitors, and no fewer than three cars went into ditches through negotiating bends over speedily.

Having at long last obtained lunch at Salzburg, we once more got under way, and proceeded, at the foot of mountains, along the worst surfaces one could possibly imagine. Shortly we reached rising ground, where we saw a prosperous agricultural country, in which the cut clover is stacked on poles to dry, and the people of the better classes are not ashamed to be seen smoking pipes in the open. The architecture was in striking contrast to that in Bavaria, the house fronts being ornate in the extreme, and usually in very good taste. Our way led us constantly across rivers, which were very high by reason of the recent unusually heavy rains, and we observed that nearly all the little wooden bridges had the appearance of being new, it being evident that they had been specially rebuilt against the strains they have been submitted to in connection with this competition. The road surfaces improved towards the end of the day's stage, and in due course the Britishers all arrived at this centre of the silk industry, the hotel proprietors of which have never been so hustled and bustled about since Napoleon the Great was here to enliven matters. Prince Henry of Prussia was among those who dined in the plain little room where the British contingent attended to the inner man, and won yet greater admiration by his absolutely charming and unassuming manners.

Third Day's Run.

Vienna, Friday night.

There was the usual scene of animation before the start from Linz this morning; while the fact of the overnight announcement that the Danube is so swollen that the route just outside the Austrian capital might have to be altered because of some of the bridges being under water, lent an element of curiosity that made one forget that this was the third night in succession of which we had risen from our beds after enjoying no more than three to four hours' sleep. In the garage it was plain to see that matters were conducted in a somewhat lax fashion, for immediately the doors were opened the competitors and their motor-men seized their bags and trappings, and made for their cars, where they commenced operations, leaving their observers to single them out as soon as it should suit them. The replenishing of petrol and lubricants was arranged for in a large open space just outside the motor house, where the British contingent had a huge section boarded off for themselves.

At the starting line, the brief intervals in the clouds of murky exhaust were not devoid of interest. Some of the competitors were very amusing; for instance, there was the Berlin Jew, whose hobby was elaborate bodywork, his especial pride a plush-lined tool-box beneath the side step of his long wheel-based car. Another little gentleman, who journeyed through the competition in all the glory of a terra-cotta coloured coat, soft felt hat and spats, persistently carried a little Pomeranian terrier under his left arm and never let go, even when he volunteered for active service to the daring extent of pouring petrol into the tank of his car. As usual, Prince Henry was in readiness as early as any of the competitors, and occupied the wait, previous to his turn for being started off, by chatting with anyone near him. Mrs. Edward Manville he complimented highly on her skilful driving, and paid a tribute to British sportsmen when he observed, "I have been struck by the consideration with which all the English competitors have been handling their machines throughout, and my only regret is that I am unable to say the same concerning the majority of the others who are figuring in these runs. I exceedingly regret the scorching that has been taking place, and have heard many complaints about it."

There was nothing remarkable about the roadway until we had passed out of Kleine Erla, when we suddenly found ourselves confronted with the steepest gradient that has been encountered since leaving England. Presently we came on to more level road, but it was also the greasiest so far experienced, and gave us cause to be thankful our cars were shod with Continental non-skids.

Entering Melk, which lies halfway between Linz and our destination, we learnt of the second serious disaster that had occurred since the start of the competition. It appeared that while passing the Post Office at the crest of the roadway in the main street, a townsman, of 50 years of age, who was blind and deaf, came out from behind a cart immediately in front of Mr. Max Krone's car (No. 148), and though that machine was proceeding so slowly as to be stopped within ten feet, the man was knocked down and the near side front wheel passed over his body. In ten minutes after their departure the injured man had died, but the extraordinary thing about the whole affair is that no inhabitant of the town holds the motorists in the least to blame for the catastrophe, nor did they manifest any animosity towards us when we came along. Even the bereaved family did not display any grief, but actually remarked, "He was never any good to us, for he had been almost constantly drunk for twenty years past; so now we shall have the insurance—and shall be rid of him."

While lunching at Melk, an aged locksmith entered the room in which we were seated at table, and delivered himself of a set speech of welcome, in the course of which he pointed out that as an expert in making locks, he could conscientiously give us his opinion that the Coventry-built Daimlers met with his entire approval, that he had a son who could speak English, that he had walked 12 miles that day purposely to see the British competitors, that —— At that stage the landlord of the hotel asked him if he would be good enough to withdraw, and he complied after a few flourishes with his hat. After we had been served with coffee, and the glass of water which always accompanies it in Austria, and had had the bravado to set matches to those little smoke-stacks which they call "Virginias" in this part of the world, we decided to climb up to that old fort—the Royal Palace—which stands on a height above the town, and offers superb views of the Danube in all directions. In the Library here we saw the priceless eighth century manuscript of a work on Natural History, written by the Venerable Bede.

The Halt at Vienna.

Vienna, Saturday night.

Though this is an "off day" from the competition, and over 100 extra cars are in this city on account of it, horseless carriages were never at such a premium here as they are to-day. The reason is that all the competing machines have been washed and are on exhibition in the buildings of the K.K.—everything is K.K. in Austria—Landwirtschaftliche Gesellschaft in the Prater near the Rotunda, so that although the foreign competitors wanted to practise the Semmering Hill climb, it was impossible for them to do so. Of course the Austrian and German competitors have little anxiety in this matter, since the majority of them know the course thoroughly. The Britishers, however, made an excursion to it to-day on such old crocks of cars as they could hire for trifles ranging from £8 to £10 a-piece, and it was a comic sight to see the company mounted in such sorry fashion after the superb and handsome vehicles they had been travelling in hitherto.

So far the record of the run is that 133 cars set forth from Frankfort, 128 from Munich, 115 from Linz, and 115 were here last night. All are eligible to continue the three remaining stages of the trial, and, save Mr. Charles Hardy, whose ill luck has already been reported, the cars of the British contingent are all running well. Thus there are 12 Coventry-built Daimlers and Mr. E. J. Robertson Grant's Argyll to put up what performance they can on behalf of the home industry. As to the drivers, it is now possible to form some opinion of their relative methods. For instance, Mrs. Edward Manville has every chance of success by reason of the fact that, so far, the competition has not fatigued her in the least, that her car is running perfectly, and that she is handling it with an extraordinary skill and lightness of touch which is all her own, which puts the least possible strain on the mechanism, and which has won the unqualified admiration of her fellow competitors. Lord Montagu of Beaulieu is driving with the knowledge and knack of a pioneer motorist. He is pursuing tactics of his own by refusing to run all day in the cloud of dust occasioned by the scorching already alluded to. After being sent from the starting-line, he drives to his hotel for breakfast each morning, picks up his luggage, then pursues the road in peace and quietness.

Perhaps the steadiest driver we have is Mr. Robert Stotesbury, who takes no chances and does not worry his car, but goes philosophically along, and intends to reserve his machine for the two events for which it will be necessary to put it to the real test. Mr. Arthur Birtwistle is having an easy time of it with his "Forty-five," and is also one of those who are pursuing their own lines of conduct. All we know of him is that we see him set out each morning and meet him all safe and sound each night, and that he evidently intends to make a good try for the hill climb, because he has requested his friend Major Tye to find a seat on some other car for that event, as he is a married man, and the knowledge of that fact would make him (Mr. Birtwistle) a bit nervous were the Major on the car. Mr. William Rendle is driving his father's machine with considerable skill. He and his father seem to be getting more fun out of the competition than any other members of the team. In the Cavalier Gino de Martino, who is driving Mr. Percy Martin's car, we have a typical sportsman of the modern Italian school, and an amateur who, for sheer dash and skill, must be allowed to be unsurpassed by any of the drivers of the Daimler machines. He has the advantage over them of having handled 90-h.p. cars, and this fact is brought into relief by studying his "corner work."

HERKOMER TROPHY.—The team of Daimler Cars which are taking part in the Herkomer Trophy, as announced by us in recent issues, were driven over, practically *en masse*, to the scene of the start at Frankfort. The pictures above show some of these cars *en route*. In the top views the German Gordon-Bennett course is recalled, the scene of the photographs being at the Saalburg, the right-hand one showing one of the cars coming up the hill at this point. Of the lower pictures, the left shows the Daimler Cars awaiting registration at the Landwirtschaftliche Halle, Frankfort a/M., and the right their garage in the same city.

Innsbruck, June 11th.

After the Semmering Hill climb of yesterday, which had proved more or less disastrous to some of the competitors' cars—including Mr. A. Birtwistle and Mr. Percy Martin's Daimlers—we had a long and trying run to this town. The road gradually rises to a height of 1,100 metres at Innichen and 1,200 metres at Brenner, but it drops down to 700 metres between these stages.

Munich, Tuesday, June 12th.

Ninety-eight cars started from Munich, and the last stage of the competition for the Herkomer Trophy was concluded to-day, after the short run from Innsbruck, by some speed trials in the Forstenrieder Park. The course is 5½ kiloms. in length, and commences with a flying start of 800 metres downhill, in order that the cars may get up a thoroughly high speed. The British cars made the following times:—Lord Montagu of Beaulieu, 3m. 22s.; Mrs. Edward Manville, 3m. 37s.; Mr. W. Rendle, 3m. 40s.; Mr. A. D. Grigg, 3m. 40s.; Mr. W. H. Ash, 3m. 43s.; Mr. R. Stotesbury, 3m. 55s.; Mr. G. F. Heublein, 4m. 27s. Mrs. Edward Manville's car was the same 35-h.p. Daimler which she drove in the contest last year, Mr. A. D. Grigg's being also a 35-h.p. Mr. G. F. Heublein drove a 30-h.p. car of the same make, but the others all had the latest 45-h.p. models. Prince Henry of Prussia on his 40-h.p. Benz covered the distance in 3m. 54s., but Herr Willy Pöge made the fastest time, 3m. 8s., on his Mercedes.

H. M. B.

Points of the Contest.

Edgar Ladenburg, the winner of last year's contest, was absent at the start on account of a collision with a Berliet car that same morning in Frankfort.

A protest was entered against certain F.I.A.T. and Mercedes cars on a question of their carriage bodies, and it was decided that they should not participate in any awards, although they were allowed to start.

HERKOMER TROPHY.—Prince Henry of Prussia at the registration station for the cars at Frankfurt a/M.

Contrary to the telegraphic information published last week, Prince Henry of Prussia has, throughout the entire trial, personally driven his 40-h.p. Benz.

Mr. Charles Hardy agreed to a proposal put forward by Mr. Herdman Ash and the committee that he should drive the former's car.

The Princess of Saxe-Meiningen was among the lady passengers.

In Austria a speed of 45 kilometres per hour is authorised, and several competitors seemed to have stretched this limit in the same proportion as they are usually in the habit of doing with much slower legal limits. Such racing enthusiasts reckoned without their host in Prince Henry of Prussia, for instead of giving way to the infuriated tooting of those who wanted to pass, he calmly drove along at 45 an hour in the middle of the road, and as this did not please those that were thus forced to moderate their tactics, some of these competitors considered the action suitable grounds on which to base a protest. His Highness represented to the committee that it was not only a competitor's right, but that it was his duty to prevent breaches of the law on the part of fellow competitors in an event of this nature, and it is gratifying to know that in this attitude he was upheld by those in authority, who reprimanded the offending drivers and threatened with disqualification those who should in future break the laws of the country through which cars were at the time passing.

June 9th was an "off-day" for the competitors, the cars being on exhibition in the Prater, where all the fashionable society of Vienna flocked to view them. Of the 134 starters, 115 were "staged." After this day of rest at Vienna came the famous Semmering Hill, on the road from Vienna to Klagenfurt.

In rounding a corner near Schottwein, Mr. Birtwistle's 45-h.p. Daimler broke a wheel, and three competitors following immediately behind — Mr. Percy Martin's Daimler and the Adler cars belonging to Mr. Vogel and Mr. Heymann—came into collision, and had to retire. Happily no one was hurt.

Car No. 43, E. Reiss' Itala, broke an axle through running into a tree.

A reception was held at the Sandwirt Hotel, Klagenfurt, which was attended by Prince Henry of Prussia.

Mr. F. Rendle, on his 45-h.p. Daimler, we learn, covered 8 kiloms. on Semmering Hill in 10 minutes, whilst Messrs. Ash, Grigg, Morgan all did better than their official "formula" speeds.

Freiherr Von Born's 70-h.p. Mercedes gained a first prize for body-work, awarded in connection with the Exhibition in Vienna.

The committee have decided that they will not make known the times of the competitors in the Semmering Hill Climb, the chief reason for this being that they do not wish these times to be used by the competitors, and thereby possibly create a misapprehension in the minds of the public in respect to this particular event. This decision is the object of considerable adverse criticism.

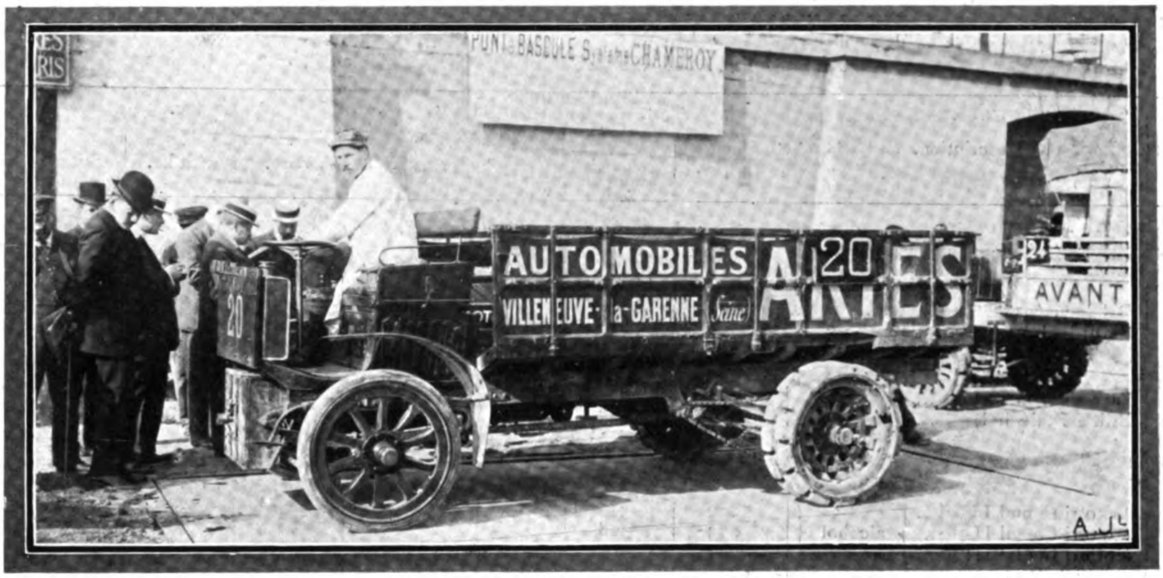
One hundred and two cars left Klagenfurt for Innsbruck.

Irish Reliability Trials.

A REPRESENTATIVE list of entries has been received for these trials, which commenced on Wednesday last, and conclude to-day (Saturday) with a hill climb. The rules and full particulars were published in THE AUTOMOTOR JOURNAL of May 12th last. Twenty-four cars were entered in Section I, which is only open to amateurs ordinarily resident in Ireland. Nine of these also entered for Section II in order to be eligible for further prizes, but in addition there were ten entries from members of the trade who could not compete in Section I. Two other entries were also received for the hill climb, which could be entered for as a separate event by those not taking part in the run.

Monte Carlo to London by Motor Car.

THE fashion once having been set of attempting to drive by motor car from the Riviera to London in the shortest possible time, it was a foregone conclusion that, whatever the result of the first attempt might be, there would be numberless motorists who would endeavour to go one better. Mr. Jarrott's drive, on his Crossley car, at the time was considered a very fine performance, and the Hon. C. S. Rolls followed suit, on his Rolls-Royce machine. A third run is now reported. On Saturday last, June 9th, Mr. H. R. Pope, on a 24-h.p. Itala car, started from Monte Carlo at 2 p.m., accompanied by three passengers, with the object of creating a new record to London. This he succeeded in doing by arriving at St. James's Street, London, on Monday morning at 2.5 a.m., the elapsed period working out at 36h. 5m., this being 1h. 23½m. inside Mr. Rolls's time of 37h. 28½m. On the journey, it is reported, 3h. 40m. were lost in repairing outer covers and inner tubes up to Boulogne. At Boulogne, the boat was nearly one hour late in leaving for Folkestone, and one hour was occupied at Folkestone in removing the car from the boat.



INDUSTRIAL VEHICLE TRIALS IN FRANCE.—The Aries Lurry. This is an ordinary chain-driven heavy vehicle but has the engine placed beneath the driver's seat in order to economise space. An interesting feature is the special form of solid rubber tyre employed on the driving wheel.

FRENCH INDUSTRIAL VEHICLE TRIALS.

ON Wednesday, the 6th June, the Heavy Vehicle Trials organised by the Automobile Club du Nord de la France commenced. The selected route was between Paris and Tourcoing, which enabled the vehicles to pass through a region, the inhabitants of which were particularly likely, on account of their industrial pursuits, to take a very lively interest in the event. The trials lasted until Tuesday of this week, and comprised the following seven stages, for which maximum times were fixed:—

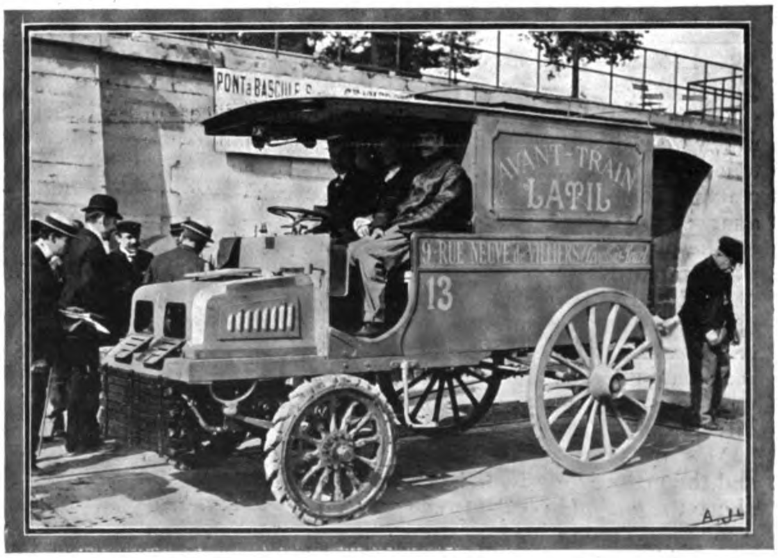
		kiloms.	Max. Time. hrs.
June 6.	Paris, Versailles, Saint Germain, Pontoise ..	49	7
7.	Pontoise, Meru, Beauvais	50	7
8.	Beauvais, Froissy, Breteuil, Amiens ...	60	8
9.	Amiens, Villers-Bocage, Doullens, Beaumetz-les-Loges, Arras	68	9
10.	Arras, Douai, Pont-a-Marcq, Lille, Roubaix, Tourcoing	72	10
11.	Tourcoing, Mont-a-Leux, Mouseron, Courtrai, Pecq, Tournay, Templeuve. Lannoy, Roubaix, Tourcoing	68	9
12.	Tourcoing, Halluin, Comines, Quesnoy, Armentieres, Lille, Tourcoing	65	9

The last two days were spent in making excursions from Tourcoing as a centre, the total mileage completed since the start of the trials being in this way brought up to 272 (432 kiloms.). After the trials had finished, an exhibition was held during the next two days.

Competing vehicles were divided into two main classes, (1) Public Service Vehicles, and (2) Transport Vehicles, and in each class there were further sub-divisions, according to the number of passengers or amount of load carried. Repairs and renewals had to be made outside the enclosures in which the vehicles were stored over night, and the time thus occupied was added on to the running time. Those competitors who completed every stage within the maximum allowance as specified above, are eligible for the various awards. On the last day of the trials a test of the fuel consumption was made.

No fewer than twenty-nine entries were received for the various classes, and of these twenty-five, particulars of which are given in the accompanying table, turned up at the start.

Of the starters, the Janvier lurry is, perhaps, the most interesting, for it has six wheels, the four which are in front being mounted on a kind of bogie carriage connected with the main frame by a special system of springs. The object of this arrangement is to enable the wheels to surmount an obstacle without twisting the frame. All four of the front wheels are steered simultaneously on the Akermann principle, and the rear wheels are driven by



INDUSTRIAL VEHICLE TRIALS IN FRANCE.—The Avant-Train-Latil. The motor and machinery of this vehicle are all beneath the wide bonnet in front, and it is the front wheels which are driven by them. These fore carriages are designed so that they can be attached to existing vehicles.

INDUSTRIAL VEHICLE TRIALS IN FRANCE.

PARTICULARS OF COMPETING VEHICLES.

Official No.	Description.	Weight.		Trans-mission.	Engine.					
		Empty.	Loaded.		H.P.	Cyls.	Bore.	Stroke.	Speed.	Ignition.
	Class 1.—Public Service Vehicles.									
	Section I (12 *to* 24 *passengers*).									
		kilogs.	kilogs.							
1	Delahaye (12 seats)	2,120	3,320	CC	16	4	110	88	1,500	b
2	Bayard-Clement I (12 seats)	2,165	3,400	S	35	4	140	120	1,000	M
	Section IV (30 *passengers*).									
3	Bayard-Clement II	3,845	5,070	S	24	4	140	100	1,000	b
4	Brillie I (alcohol)	4,300	6,425	G	32	4	140	125	900	M
	Class 2.—Transport Vehicles.									
	Section I (*Tricars carrying* 50 *kilogs.*).									
5	Mototri Contal I alcohol	289	349	C	4	1	86	80	1,600	b
6	Mototri Contal II	273	328							
7	Mototri Contal III	283	340							
8	Tricar Austral I	345	395	—	—	—	—	—	—	—
9	Tricar Austral II	347	400	—	—	—	—	—	—	—
10	Tricar Austral III	345	397	—	—	—	—	—	—	—
	Section IV (1,000 *to* 2,000 *kilogs.*).									
13	Avant-Train-Latil I	1,790	3,190	G	12	2	130	88	1,000	b
14	Bayard-Clement III	1,975	2,980	S	12	2	140	100	1,100	M
15	Peugeot I	1,605	3,370	CC	10	2	105	105	1,000	M
	Section V (2,000 *to* 3,500 *kilogs.*).									
16	Auto-Camion I (petrol or alcohol)	2,540	5,840	CC	14	2	140	120	1,300	b
18	Avant-Train-Latil II	—	—	G	12	2	140	100	1,000	b
19	Louet et Badin	2,550	5,090	CC	15	4	140	95	700	b
20	Aries	1,925	3,960	CC	12	4	105	140	1,000	b
21	D.A.C.	—	6,000	CC	20	4	130	98	900	b
22	Brillie II (alcohol)	3,380	5,005	G	20	4	120	100	1,000	b
	Section VI (*above* 3,500 *kilogs.*).									
23	Janvier (petrol or alcohol)	—	10,300	CC	24	3	150	140	850	M
24	Avant-Train-Latil III	—	—	G	28	2	140	105	1,000	b
26	Prunel	—	—	CC	30	4	135	140	800	b
27	Peugeot II	—	7,175	CC	18	4	105	105	1,000	M
29	Brillie III (alcohol)	—	—	G	20	4	120	100	1,000	b
	Section VIII (*special bodies*).									
25	Mors (milk van)	4,695	6,695	CC	28	4	—	—	1,000	M

Explanation.—*Transmission.*—CC = Side Chains; S = Shaft; G = Gear. *Ignition.*—b = Battery; M = Low-tension Magneto.

side chains in the ordinary way. Another device—of which we give a photograph this week—which is of an unusual character, is the Avant-Train-Latil. This machine consists of a fore-carriage, which may be attached to the frame of any ordinary vehicle. It has an engine placed transversely above the axle, and the two wheels are driven through spur gearing by short universally-jointed cardan shafts. These shafts form extensions of the differential-shaft, and an ordinary change-speed gear-box is mounted close up to the engine. Steering is accomplished by turning the front wheels in the usual way, the specially arranged universal joints in the two driving-shafts making this possible.

Most of the heavier vehicles are driven by side chains, and the majority of them have the driver's seat placed above the engine in order to economise space. Although some are running with iron-tyred wheels, several are shod with rubber, and a feature of the tyres which seem to be most in use is that the tread is not continuous, but is formed out of a series of rubber pads. In some cases these pads are arranged on the twin-tyre principle, in which case they are staggered so as to overlap. Not the least important of the various classes is that for the tri-cars, which can carry weights up to 50 kilogs. Of the machines entered in this section, the Mototri Contal is already known in this country, where it has taken part, as a passenger vehicle, in the trials organised by the Auto Cycle Club. The use of this class of machine for light transport work is already finding favour here in the distribution of daily newspapers; but there must be many other businesses in which such a handy and speedy "one-man" vehicle would prove of really great service, and these French trials should, therefore, appeal directly to a much larger section of the business public than would be the case were it only concerned with the testing of heavy lurries. The eighth section of Class II, in which the Mors milk van is the only competitor, was not formed until the time of the weigh in. Previously this vehicle had been in section six, but the question arose as to whether the fixed body of a very special type—which weighed 1,700 kilogs.—should be considered as a separate item or not, and it was finally decided to constitute an additional class in order to get over the difficulty.

INDUSTRIAL VEHICLE TRIALS IN FRANCE.

TIME OCCUPIED ON DAILY TRIPS.

Official Number.	Vehicle.	1st Day, Paris—Pontoise, 49 kiloms.	2nd Day, Pontoise—Beauvais, 50 kiloms.	3rd Day, Beauvais—Amiens, 60 kiloms.	4th Day, Amiens—Arras, 68 kilom.	5th Day, Arras—Tourcoing, 72 kiloms.	6th Day, Tourcoing—Tournay—Tourcoing, 68 kiloms.	7th Day, Tourcoing—Quesnoy—Tourcoing, 65 kiloms.	Consumption of Fuel per tonne-kilom.
	Class I.—Public Service Vehicles.								
	Section I (12 to 24 passengers).								
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	litres.
*1	Delahaye	2 20 35	2 3 21	1 56 21	2 10 22	3 53 0	3 21 52	2 51 57	0·194
2	Bayard-Clement I ...	1 53 35	1 37 36	1 47 0	2 56 30	2 34 36	2 1 35	3 38 39	—
	Section IV (30 passengers).								
3	Bayard-Clement II	2 18 34	1 41 15	4 29 24	6 50 49	6 38 0	2 51 22	—	—
*4	Brillie I (A)... ...	2 3 53	1 55 22	4 27 21	3 31 22	3 45 45	2 56 22	3 6 52	0·20
	Class II.—Transport Vehicles.								
	Section I (Tricars carrying 50 kilogs.).								
*5	Mototri Contal I (A)	4 7 55	2 32 19	4 30 8	2 50 10	3 2 18	3 50 12	3 36 50	0·84
*6	Mototri Contal II ...	4 8 5	2 32 21	4 35 51	2 51 44	3 4 15	3 51 15	3 55 52	—
*7	Mototri Contal III (A)	4 9 19	2 32 21	4 29 45	2 50 54	3 3 40	3 51 28	3 37 20	1·03
*8	Tricar Austral I ...	1 44 37	1 21 20	1 30 6	1 59 10	2 40 0	2 41 2	2 4 7	—
*9	Tricar Austral II ...	1 49 51	1 20 45	1 22 57	2 0 16	2 39 57	2 41 0	2 25 15	—
*10	Tricar Austral III ...	1 49 47	1 20 48	1 30 8	1 59 15	2 42 3	3 51 53	2 2 55	—
	Section IV (1,000 to 2,000 kilogs.).								
†*13	Avant-Train-Latil I	3 18 34	2 52 31	3 3 38	3 34 52	4 29 18	4 20 52	4 42 53	0·146
*14	Bayard-Clement III	2 27 52	2 10 32	2 37 56	3 0 55	3 16 0	3 46 12	3 0 53	0·153
15	Peugeot I	3 24 16	2 47 35	4 3 54	4 33 0	5 52 15	—	4 28 54	—
	Section V (2,000 to 3,500 kilogs.).								
16	Auto-Camion I ...	5 52 48	5 48 0	—	—	—	—	—	—
†*18	Avant-Train-Latil II	4 6 20	3 50 43	4 5 7	4 47 6	5 33 1	5 25 38	—	0·168
19	Louet et Badin ...	3 47 3	—	3 50 20	8 13 53	7 39 8	8 49 22	4 54 15	—
*20	Aries...	3 15 4	3 46 25	4 21 58	5 3 30	5 25 22	5 7 15	4 54 5	0·128
21	D.A.C.	4 28 15	4 5 3	—	—	6 7 25	5 45 3	5 4 30	—
*22	Brillie II (A) ...	3 7 47	2 35 4	2 40 0	3 13 3	4 27 0	3 53 27	3 37 40	0·177
	Section VI (above 3,500 kilogs.).								
23	Janvier	5 40 30	5 44 0	6 12 49	7 21 52	8 20 40	7 45 5	5 35 0	—
†*24	Avant-Train-Latil III	4 32 30	4 13 35	4 35 24	5 49 29	6 4 0	5 53 17	5 53 15	0·095
*26	Prunel	2 49 23	2 21 18	5 58 0	3 51 27	4 6 12	3 34 31	3 44 19	0·177
*27	Peugeot II	3 18 0	3 0 0	3 25 0	3 52 37	4 36 37	4 36 58	4 16 36	0·111
*29	Brillie III (A) ...	2 55 1	5 8 47	3 38 50	4 38 29	4 3 0	4 6 18	3 50 29	0·110
	Section VIII (special bodies).								
25	Mors (milk van) ...	4 55 9	—	2 25 4	3 0 52	6 5 55	3 50 0	—	—

* Receive medals for having successfully completed the seven stages. † Maison Latil receives a team prize for their three machines.
(A) Receive prizes for using alcohol.

Not a single competitor dropped out during the first day's run to Pontoise, which place is 49 kiloms. from Paris. One of the Austral tricars made the best time, 1h. 49m. 47s., while one of the vehicles in section five was the slowest, having spent nearly six hours *en route*. On the second day the Louet and Badin and the Mors milk van were missing in the evening, but they eventually turned up, and were ready for the start from Beauvais to Amiens, which they both reached safely. The third day's route from Amiens to Arras gave the competitors the first hill-climbing of any note, for it is on this road that the Doullens Hill, which has a gradient of about 8 per cent., is situated. Between Arras and Tourcoing, which route was traversed on the fifth day's run, the vehicles had to travel over much of the well-known and equally well-detested *pavé* which characterises certain districts in France. In spite of this, however, all those who started in the morning arrived at their destination in good order. Avant-Train-Latil II. was about an hour behind its usual time, owing to a minor accident in passing over some tram lines.

During the sixth day's run, when the route crossed the frontier into Belgium, some of the officers of the General Staff accompanied the vehicles in order to watch their behaviour from the military point of view. Twenty-four of the 25 starters remained in on the last day, and all these successfully concluded the trials. They were not all eligible for awards, however, as some of them had been delayed by breakdowns. So far as the net times occupied by the various vehicles in completing each stage are available, they are given in the accompanying table, which also indicates the result of the fuel consumption test which was carried out during the last day's run.

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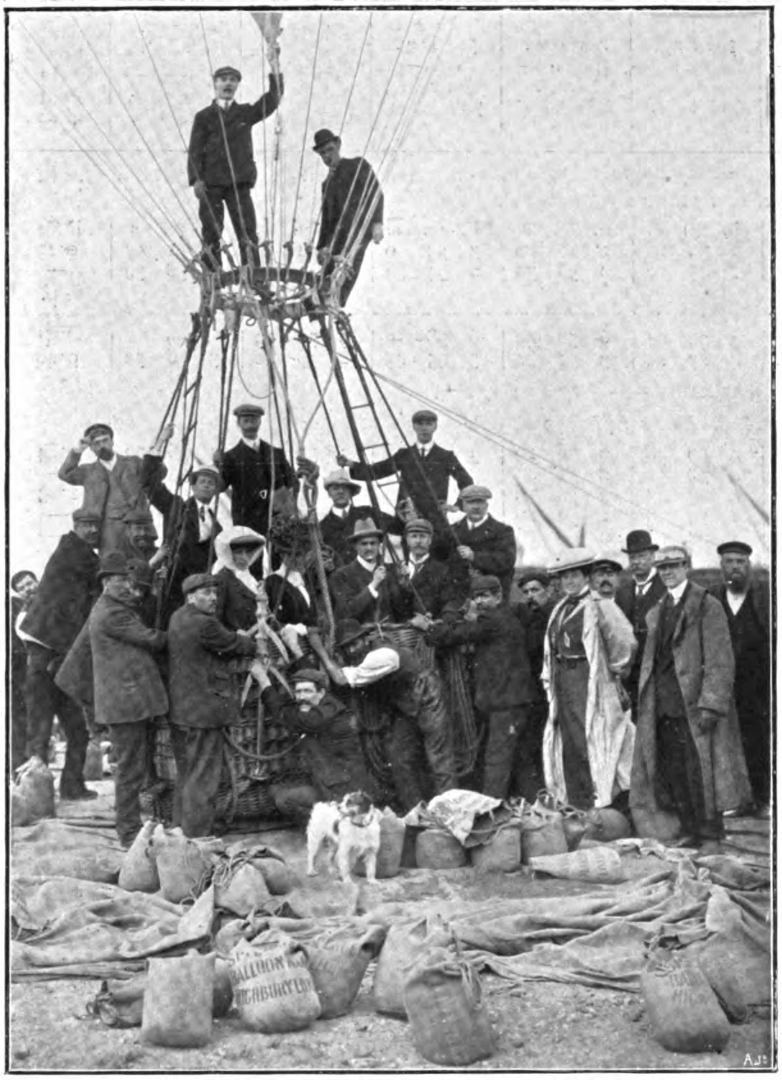
For the Relief of Sufferers from the Motor 'Bus.

An enterprising chemist is attempting to "suck some small advantage" from the noise "alleged" to be made by motor 'buses, and he is advertising as follows: "To travellers by motor 'bus. Medicated odourless wool, suitable for ear-stopping."

AERONAUTICS.



On Saturday last the new "City of London" balloon, which has been specially built for Mr. Frank H. Butler to compete in the Gordon-Bennett Competition for Balloons, made its maiden ascent from the Wandsworth Gasworks. She has a capacity of 77,000 feet, and on Saturday carried 9 passengers, seen in our photograph as follows, reading from right to left of the "car": Mr. Frank H. Butler, Mr. Pollock, Hon. C. S. Rolls, Professor Huntington, Lord Royston, Hon. Mrs. Assheton-Harbord, Hon. Miss Heron-Maxwell, Mr. Wright, and Mr. Percival Spencer.

The Largest English Balloon.

THE big balloon, cubing 77,000 feet, which has recently been built for Mr. Frank H. Butler, made a trial trip from the Wandsworth Gas Works on Saturday last. The great vessel is capable of taking nine passengers, and on its first excursion the car was occupied by the Hon. Mrs. Assheton-Harbord, Miss Heron-Maxwell, Lord Royston, Mr. C. F. Pollock, Prof. Huntington, the Hon. C. S. Rolls, Mr. Wright, Mr. Percival Spencer, and Mr. Frank H. Butler, its owner. A successful flight was made as far as Banstead Downs, where the balloon descended, and its performance was eminently satisfactory. As one of the representatives of the Aero Club of Great Britain, Mr. Butler had the "City of London," which is the name given to the balloon, built to represent this country in the Gordon-Bennett Balloon Cup Race, which starts from Paris on September 30th. The "City of London" is, as a matter of fact, we understand, the largest balloon built in the British Islands since the "Monster Balloon" of the "Ingoldsby Legends," of whose proceedings Thomas Barham made so much fun.

A Successful Balloon Excursion.

A VERY successful balloon excursion was made on Sunday last, under the auspices of Mr. Percival Spencer, the balloon ascending from the Wandsworth Gas Works. Among the passengers were Miss Godwynne Earle, Mr. Louis Bradfield, and other members of the Coliseum company. A straight run was made at a good pace, the wind blowing at an almost ideal speed for ballooning, from Wandsworth to Petworth, where the aeronauts descended to find out where they were, and then continued their journey to Bognor, where they actually passed out over the sea. Fortunately, however, a contrary current of air was encountered which took the balloon inland again, and a descent was safely made between Bognor and Chichester. The balloon was pursued by a Crossley car in charge of Mr. Reid, but he was not successful in being in at the death, and it was only at Chichester that the rival parties of motorists and balloonists met at dinner. This excursion was, it appears, Miss Earle's second trip only by balloon, so that she is not such a veteran aeronaut as the public had previously been led to believe was the case.

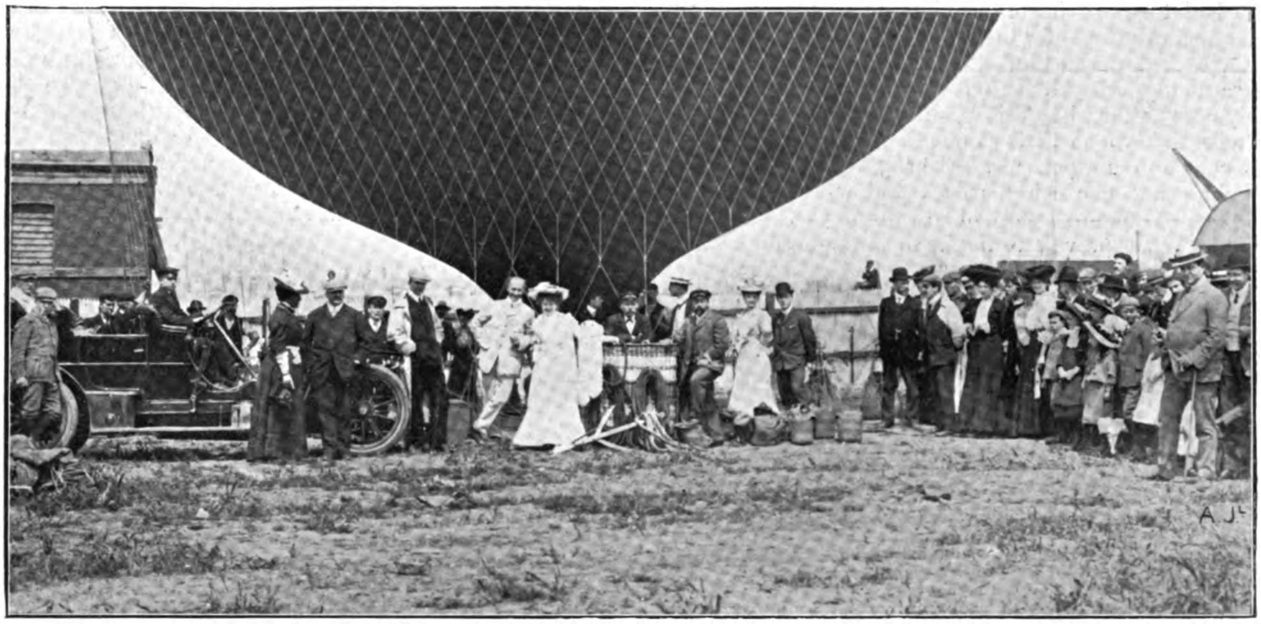
Sir H. Maxim on the Wellman Expedition.

SIR HIRAM MAXIM, who is generally regarded as an authority on aerial locomotion, has been expressing very much the same opinions as regards Mr. Wellman's Polar expedition as we put forward last week. He does not believe in its possibility. Sir Hiram appears to think that a navigable airship may be produced in the near future, experiments in England, France and Germany having demonstrated the practicability of such a machine; but so far he regards them as quite useless in the least wind. All these observations are doubtless quite correct, but Sir Hiram Maxim talks as if he had never heard of the Lebaudy airship, and did not at all realise the long journeys Lebaudy I and Lebaudy II have made against very considerable antagonistic winds.

* * * *

Made in England.

UNDER instructions received from Madrid, the Daimler car, which has just been purchased by H.R.H. Princess Henry of Battenberg, is to be immediately sent over to Germany for the use of H.R.H.



Miss Godwynne Earle and Mr. Louis Bradfield of the London Coliseum starting last Sunday on their balloon trip. In the picture will be noticed Lord Royston, the Hon. C. S. Rolls, Mr. Butler, and many others interested in ballooning and motoring. The balloon was chased by a 24-h.p. Crossley Car.

MOTOR BOATING.

Motor Boats at Liverpool.

LIVERPOOL has been the scene of a successful motor boat regatta, which was organised as an international event by the Liverpool Bay Sailing Club in conjunction with the British Motor Boat Club. Considering that this is the first event of its kind to be held in the Mersey, the organisers are to be congratulated on the success which has attended their efforts, for not only were crowds of spectators attracted from the locality, but some of the most prominent owners entered their boats for the event, which commenced on Friday morning (June 8th). Among the competing craft was Lord Howard de Walden's Rose-en-Soleil, which has been converted from the old Fer-de-Lance by Messrs. Simpson Strickland, who have installed steam machinery in the place of the petrol engine. In the first race—for 40-ft. boats over a 20-mile course—this boat led over the line, but Mr. J. E. Hutton's Hutton II, which evidently had had some slight mishap with the machinery, very quickly made up for lost time when once she was got going; the race had hardly begun when this powerful petrol boat took the lead. Mr. F. May's Defender I, the only other boat in the race, also made a very poor start, although subsequently she picked up a little. Off Garston, Hutton II was still leading, but off Eastham, Lord Howard de Walden's boat had drawn well ahead. Unfortunately, however, the wrong course was taken by the Rose, and although she led in the second round, she had to be disqualified. Hutton II thus won the race in 47 mins. 56 secs., and Defender I finished in its own good time.

In the afternoon, the second event, for boats not exceeding 30 ft. in length, took place over a distance of 16 knots. Only two starters put in an appearance, Mr. W. M. Green's Takumono and Mr. Fentiman's Javelin. Both made an excellent start, Takumono getting away slightly in front of the other. As luck would have it, however, they both ran aground outside the course, and although they got off without much trouble, the event, as a race, was naturally spoiled. At the end of the first round Takumono was still ahead, and eventually won quite easily. The winner's time for this event was 1h. 59m. 39s.

Decision has had to be deferred as to the winner of the third event, which was for motor boats for 25 ft. over all, the distance being 16 knots, the same as for event 2. In the fourth event, however, for boats not exceeding 18 ft., running over a distance of 8 knots, Mr. W. H. Barrett's Bacarra made a good run against Mr. H. W. Wiswall's Iris, in 1h. 31m. 15s. compared with 1h. 36m. 58s. Event 5, for motor boats not exceeding 16 ft., over a course of 4 miles, Mr. W. Scott-Hayward's Pop "walked over" in 41m. 31s.

Racing was continued on the second day, when the Lord Mayor of Liverpool, the Mayor and Mayoress of Birkenhead, and the Mayor of Salford honoured the proceedings with their attendance on board the committee boat. Hutton II disappointed the spectators by not turning up in time for the start for the first event, and it was not until Lord Howard de Walden's Rose-en-Soleil had taken the lead by nearly 6 mins. that the absentee put in a hurried appearance and made off at great speed after the others. Defender I and Javelin were the only other competitors. Rose-en-Soleil won the event in 47m. 31s. for the 20 miles, and although Defender I finished second in 1h. 39m. 21s., Javelin, who came in third in 1h. 48m. 9s. was awarded second prize on a time allowance. Hutton II broke down and did not complete the course. In the handicap of motor boats not exceeding 30 ft. over all, Mr. W. M. Green's Takumono was again successful over the 16 knot course, the winner's time being 1h. 15m. 7s. and that of Javelin, the only other competitor, 1h. 19m. 21s. Event 3 was a handicap for cruisers exceeding 25 ft. over all, and this event was won by Mr. S. F. Edge's Napier Major in 1h. 58m. for the 12 knots; Defender I, the only other competitor, occupied 1h. 18m. 39s., but had to allow her competitor 42m. 42s. handicap. The next event was for boats not exceeding 18 ft. to take place over a distance of 8 knots. Mr. W. H. Barratt's Bacarra, and Mr. H. W. Wiswall's Iris, were again the only competitors, but this time Bacarra gave up owing to a breakdown, and Iris gained first prize by completing the course in 2h. 7m. 32s. Event 5 was a handicap for dinghies not exceeding 16 ft., and was won by Mr. W. Scott-Hayward's Pop in 1h. 36m. 55s. for the 4 miles. What proved to be the most important event of the programme took place at the end of the second day, when the flying mile for the British Motor Boat Club Cup was held. Only the Rose-en-Soleil and Hutton II had entered, but the latter did not start owing to the mishap which had disabled her in the first event of the day. The Rose-en-Soleil "walked over," and was successful in making the splendid time of 2m. 12s., which is equivalent to a speed of 27·3 knots per hour, and establishes a very excellent record for steam boats of this kind.

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MOTOR CYCLING.

LAND'S END HOTEL.

LAND'S END TO JOHN O'GROATS.—The start of the competitors from Land's End, on Monday morning at 8 a.m., in the Auto Cycle Reliability Trial.

Land's End to John O'Groats.

OF the 93 entries, published in THE AUTOMOTOR JOURNAL last week, for this motor cycle reliability run of the Auto Cycle Club, which started from Land's End at 8 a.m. on Monday morning last, no less than 75 machines materialised on the morning to take part in the contest, 59 of these being motor cycles and 16 tricars. The whole of the contestants got away within twenty minutes, with the exception of Miss Muriel Hinde, who was recently so successful in her drive from London to Edinburgh. Miss Hinde was unfortunate in puncturing the rear tyre of her tricar at the start, which caused her to arrive two hours late at Launceston, where a halt was made for lunch. The first day's journey was to Exeter, a distance of 152½ miles, and throughout the run, with the exception of about 10 miles before reaching Exeter, the roads were in good condition, the only cause of complaint being excessive dust. The riders on approaching Exeter had some somewhat trying experiences, as the result of what apparently was heavy traction engine traffic. Forty-four cyclists completed the first day's journey to schedule time, and twelve in the passenger class.

International Cup—British Eliminating Race.

ON Thursday, June 7th, the trial for selecting the British team to compete in this event, which takes place in Austria on July 8th, was held in Knowsley Park, near Liverpool, by permission of Lord Derby. The starters in this event numbered five, as follows:—C. R. Collier, 7-h.p. Matchless; H. A. Collier, 7-h.p. Matchless; R. Morewood, 6-h.p. Westlake; A. Butt, 4-h.p. Quadrant; C. B. Franklin, 7-h.p. J.A.P. The full course of 121½ miles was made up by 27 laps of 4½ miles each. There were some awkward corners—photographs of which have already appeared in THE AUTOMOTOR JOURNAL—on which, however, most of the competitors had previously been able to practise, but on the whole the circuit was considered as a fair give and take road. C. R. Collier was started off at 9.30 a.m., and the others left the mark at intervals of 1 minute. From first to last the performance of the two Colliers, who were both riding 7-h.p. Matchless machines, was the most brilliant, although C. R. Collier had one spill when the race was half over, through running against the turf at the side of the track. Fortunately he was unhurt, and the machine sustained no more damage than a bent pedal and a twisted handle-bar. The only other accident occurred to R. Morewood, who was riding a 6-h.p. Westlake. It was in his fourth lap, while he was travelling very fast, that the steering handle of his machine suddenly snapped off, he being thrown on to the grass and his machine broken. Morewood himself was, happily, not seriously hurt, although considerably shaken.

On the whole the race was exciting, and the endeavours of the competitors to get round the two sharp bends by scraping their boots along the ground afforded a constantly recurring feature of interest. Butt, who was acting as a substitute for T. Silver on the 4-h.p. Quadrant, had a lot of trouble with his exhaust valves, no less than three being broken in five laps. It was on account of this that he retired. Morewood had to stop once in order to give attention to his petrol tank, the cap of which he had lost, and replaced with a cork, which, being airtight, interfered with the proper feed of the petrol. Franklin, on the 7-h.p. J.A.P., was riding splendidly, but was handicapped by an incorrect gearing of his machine. Another engine pulley arrived during the race, however, and this was fitted instead. At the finish of the race, however, Franklin had only completed 108 miles, the two Colliers having at that time completed the full course. The judges—the Marquis de St. Mars and Mr. E. M. Boileau—declared the team to represent Great Britain to be as follows:—

C. R. Collier, 7-h.p. Matchless, 121½ miles in 2h. 56m. 26⅖s.
H. A. Collier, 7-h.p. Matchless, 121½ miles in 3h. 21m. 48⅘s.
C. A. Franklin, 7-h.p. J. A. P., 108 miles in 3h. 20m. 54⅘s.

By being first in this event C. R. Collier secures the *Motor* Cup.

The Hon. Arthur Stanley, M.P., presided at a lunch which was held after the race, and during the afternoon some speed trials over a straight mile were run. H. Collier did the distance in 1m. 4⅗s., while Franklin's time was 1m. 14⅘s. C. Collier did not run because his accident during the morning had affected the steering of his machine.

Motor Cycle Union of Ireland Reliability Contest.

ON Saturday last the annual reliability contest, which originated about four years ago, between the Belfast and Dublin centres of the Union, took place between Belfast and Dublin, a distance of about 96 miles. The original cup, given by the Hon. Leopold Canning, it will be remembered was secured by the Dublin Centre, who scored two wins in succession, and therefore it was necessary for a new cup this year to be put up. This was done by the Triumph Cycle Company, and again Dublin has been successful this year in securing the new trophy for the first time. The conditions of the contest provide that each centre may start as many men as they wish, the result being determined on the performances of the last three men on both sides, four men being taken in the event of a tie, and five in the event of a tie between four, and so on. Reliability or non-stop performances are the only points taken into consideration, one mark out of a maximum of 100 being deducted from each competitor for each stop on the road from any cause whatsoever. On Saturday Dublin put forward a team of twenty-three and Belfast fifteen men, all on motor bicycles. A start was made at 3 p.m. from Tolka Bridge, the roads being very dusty, but otherwise favourable conditions prevailed. As a result of the run ten Dublin men and four Belfast representatives scored full non-stop points. The fifth man of each, therefore, had to be brought into reckoning for the classification, with the result that the fifth man of the Belfast team, being penalised one point, gave the win to the Dublin centre, with 500 points to 499. The non-stop men were as follows:—

DUBLIN CENTRE.—T. W. Murphy, 3-h.p. Singer; W. Jacques, 3-h.p. Alcyon; H. Mooney, 2¾-h.p. F.N.; R. H. Farmer, 2¾-h.p. F.N.; H. Quinn, 3-h.p. Triumph; Ellis, 3-h.p. Alcyon, W. H. Meredith, 2-h.p. Triumph; J. G. Drury, 3-h.p. Triumph; C. W. Smyth, 3-h.p. Triumph; C. G. H. Lewis, 2¾-h.p. F.N.

BELFAST CENTRE.—T. Denby, 3-h.p. Brown; W. Bullick, 2¾-h.p. R. and P.; A. Bullock, 2¾-h.p. J.A.P.; J. Stewart, 3-h.p. Triumph; T. Ireland, 3-h.p. Triumph.

Auto Cycle Club Eliminating Trials for the International Cup at Knowsley Park.—The selected British team, Messrs. C. R. Collier, H. A. Collier, and C. B. Franklin, with their respective machines.

Essex Motor Club.

AN open race meeting for motor cycles will be held on July 14th, at the Canning Town Athletic Grounds, West Ham. The following events will form the programme:—One Hour Record Race, limited to 76 × 76 engines; Five Miles Handicap, limited to 76 × 76 engines; Tourists' Handicap Race for Standard Machines, engines not to exceed 90 × 90; Ten Miles Record Attempt; Match, England *v.* France, any size engine.

* * * *

CLUBS AND ASSOCIATIONS.

Automobile Association.

THE Association, as already announced, will hold its Annual General Meeting at the Trocadero Restaurant on Tuesday, June 19th, when Colonel W. J. Bosworth will, we learn, have the pleasure of reporting most gratifying progress made since the inception of the cyclist patrol movement nine months ago. The strides made by the Association in the favour of the motoring public are really remarkable. New members are being elected at the average rate of about one hundred every fortnight, while the patrols are being increased and extended practically every week. Quite a pleasing form of freemasonry exists between the members, who send reliable information on the subject of police traps from all quarters of the kingdom to the Central Office at 18, Fleet Street, E.C., where it is tabulated and distributed to subscribers by telegram, telephone, or letter at any hour in the day.

Not content with this, the Committee have, after two months' careful work, crystallised a scheme by which, in a very short time, the Association will have confidential agents on every main road at distances of three or four miles, who will assist each member on his displaying the now well-known A.A. car badge, in respect of valuable information obtained within an hour or so prior to the member's arrival. It should not be forgotten that the credit of giving birth to this practical means of defence against the motor trap rests with Messrs. Charles Jarrott and Letts, who in the early summer of last year engaged a handful of professional cyclists for patrol work on the Brighton Road.

Essex County A.C.

A GYMKHANA, under the auspices of the club, takes place at Colchester to-day (Saturday), commencing at 2 o'clock, in aid of the funds of the Essex and Colchester Hospital. The Ipswich and East Suffolk A.C. have been invited to enter a team to compete in the various events, which they have accepted. The events are as follows, viz:—No. 1. Obstacle Race. No. 2. Ladies' Passenger Race. No. 3. Tortoise Race. No. 4. Starting and Stopping Race. No. 5 (Open Event) Turk's Head and Pig Sticking Competition No. 6. Musical Chairs.

Ladies' A.C.

THE following ladies have been recently elected to membership of the club:—The Countess of Portarlington, Viscountess Galway, the Countess of Gosford, the Marchioness of Linlithgow, Lady Milbanke, Mrs. Adair, Mrs. Walter Bailey Vere, Mrs. Walter Munday, Miss Mary Naylor, Mrs. Henry Stocke, Mrs. Pennell Tate, and the Hon. Mrs. Algernon Hanbury-Tracy.

The members of the club have been invited by Mrs. R. C. Turnor to meet, on the 27th inst., at Binfield Park, Bracknell, Berks. The shortest route is *viâ* Brentford, but the best—which is not very much longer—is as follows:—Putney Bridge, Kingston, Hampton, Sunbury, Staines, Egham, Ascot, Bracknell. The distance from Hyde Park Corner is 34 miles. Members should look out for police traps between Egham and Ascot.

The Grosvenor Club have asked the members of the L.A.C. to again this year visit the Grosvenor Club enclosure at Henley, on the 3rd, 4th, and 5th July. The enclosure is on the Berks side of the river, midway between Temple Island and the winning post. Admission is by ticket only.

The club gymkhana will be held at Ranelagh on the 30th inst.

Motor Yacht Club.

SOME slight alterations have been made in the racing programme of the club. On August 10th, at Cowes, a third event has been added for yacht's davit boats not exceeding 20 ft. in length. The racing on August 4th will be at Netley instead of at Seaview, and the first race will be for unrestricted racing boats without time allowance. The club regatta, on August 18th, will include five events, and several valuable cups will be competed for. The "Enchantress" Challenge Cup, presented by Mr. Lorne Currie, and a gold medal, will go to the first boat in the big class. A

Challenge Cup, presented by Mr. F. R. S. Bircham, will be the prize in the second race for the Marine Motor Association classes A, B and C, not exceeding 1,000 rating, and the Sultan of Johore's Challenge Cup has been devoted to the cruisers not exceeding 50 ft. over all. In addition there will be a race for auxiliary sailing boats, which will be required to cover part of the course under sail alone, and a "turning, restarting and reversing" competition for boats of any size. The latter event should provide an excellent test of other important qualities besides mere speed.

The weather during the week-end was ideal, and the club cruise on Saturday was of a most enjoyable character. A landing was made at Buckler's Hard in the Beaulieu River, and the tea which was carried in the club launch, in charge of the head steward, was spread on the site of the famous ship-building yards from which were launched many of Nelson's best fighting vessels during the early part of the last century. The oldest inhabitant of the village was cajoled into describing the positions of the old ships and ways, whose outline can still be traced among the fields which border the river. One of the objects of these concerted cruises is to enable owners of small boats to venture on longer journeys than they would probably care to attempt alone. The "Enchantress" launch, in charge of the club mechanic, acts the part of convoy, and is always prepared to offer assistance to any boat that may be in difficulties. Spare fuel and lubricating oil is also carried on the club launch for the benefit of the improvident.

New Forest and Bournemouth A.C.

WITH the object of forming an automobile club for the New Forest and Bournemouth and the surrounding district, the Motor Union have appointed a Provisional Committee to make the necessary arrangements for the establishment of a strong and representative club. The Provisional Committee includes the following prominent residents:—Col. J. Roberts Thomson, Major H. S. Murray, Dr. H. Nankivell, Dr. W. H. Marriner, Dr. H. Simmons, Dr. W. B. Nankivell, Dr. A. D. Pithie, Dr. St. G. E. Harris, Messrs. H. E. Acklom, J. J. Allen, J. E. Beale, W. Willett, J. Peyto Shrubb, H. Newlyn, W. P. Evans, P. B. Ironside Bax. Mr. Clement J. Haydon, of Westover Chambers, Bournemouth, has undertaken the duties of hon. sec., *pro tem.* This committee are convening a general meeting of automobilists in the district, at the Balmer Lawn Hotel, Brockenhurst, on Saturday, June 23rd, at 3.30 p.m., for the purpose of formally founding the club (which the committee suggest shall be called the New Forest and Bournemouth Automobile Club), adopting rules, and electing a president and vice presidents and a committee.

Society of Motor Manufacturers and Traders.

THE ballot for space at the Olympia November Exhibition of the Society was held last week, the ballot being confined to those who have signed bonds not to exhibit at any other show in London. In the motor car section, 122 firms balloted, amongst them being all the best known British manufacturers and agents for foreign firms. Messrs. De Dietrich were the lucky drawers of first place for choice of position. In addition to these, 34 firms were included in the accessories section, 14 in the tyre section, and 13 in the components section. The net result is that practically the whole of the space in the building has been taken up. The policy of the Society in having two shows in the year, one for pleasure cars and the other for commercial vehicles and marine motors, appears, therefore, to be fully justified.

* * * *

CORRESPONDENCE.

⁎ *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

ONE-SIDED JUSTICE.

To the Editor of THE AUTOMOTOR JOURNAL.

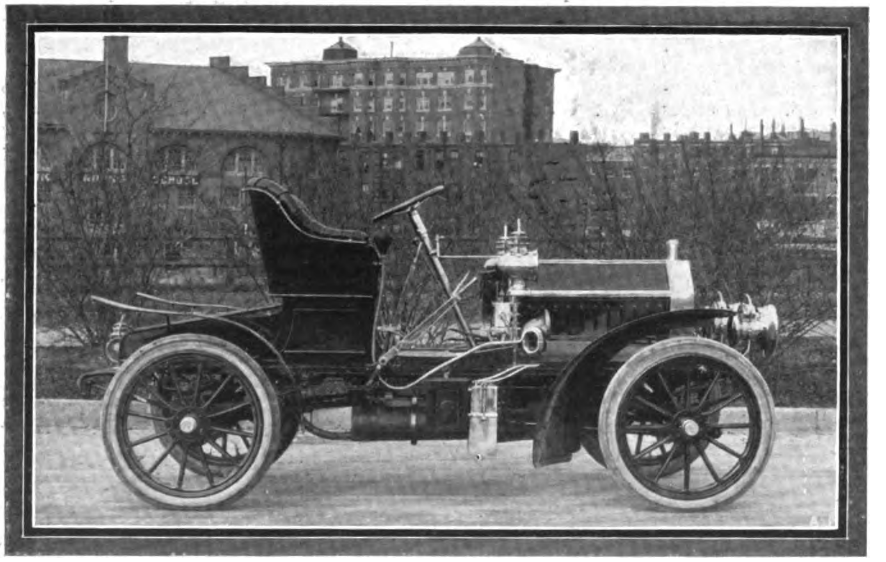
SIR,—It was recently reported in the papers that at Uttoxeter the driver of a cart was charged with deliberately placing his vehicle and horse across the road in order to obstruct an approaching motorist, who, to avoid a collision, was obliged to run into a hedge. A gentleman who was riding in the car was thrown out and severely injured. As in cases of this kind the driver of a horse-drawn vehicle is generally discharged with a caution or fined 1*s.*, it is refreshing to observe that in this instance a fine of £1 was imposed for obstruction, and another of £5 for causing an accident. But even this punishment by no means corresponds with that dealt out to motorists charged with offences far less mischievous.

I have been present in Court when an automobilist was fined £10 and costs for very slightly exceeding the speed limit on a straight, open, country road, it being admitted that no man, woman, child or animal was within sight, and the evidence depending on the accuracy of a cheap stop-watch, and when, in addition, it was a first offence.

It seems scarcely fair that a purely technical misdemeanour, which might have been committed inadvertently, should be punished by the infliction of a fine almost twice as large as that demanded from a spiteful driver, who, by deliberately and of malice aforethought breaking the law, caused severe injury to a gentleman enjoying his indisputable right of using the King's highway.

I am,
Your obedient servant,
W. J. BOSWORTH, Colonel.
Chairman, Automobile Association.

18, Fleet Street, E.C.
June 4th, 1906.



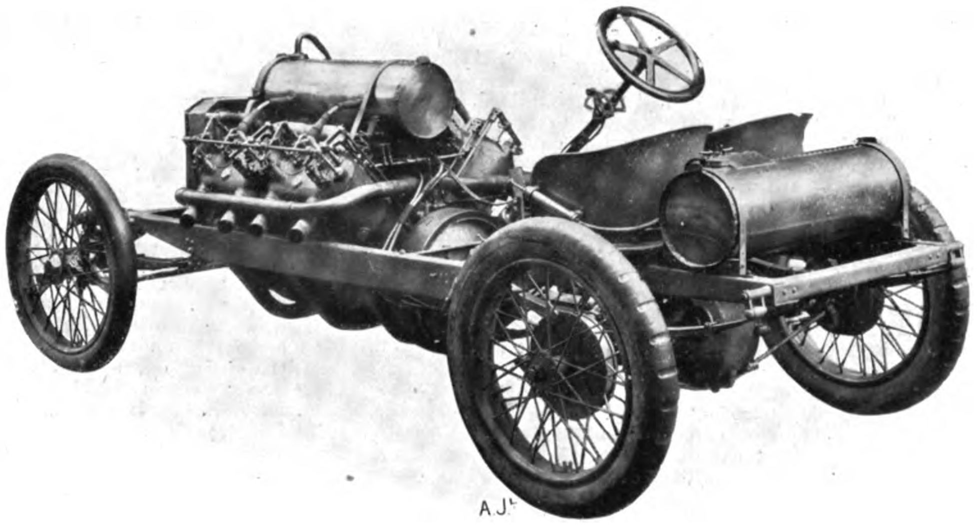
An American-built Napier Runabout.—No less than 150 light 15-h.p. cars, of the type shown in our illustration, were put in hand by the Napier Motor Company of America last autumn, since which time large numbers of them have, we understand, been sold out there. Except that it has a live-axle drive, instead of side-chains—the chassis is identical with the well-known English model of that power. The American manufacturers are also building for the U.S.A. market 60-h.p. cars that are similar in every respect to the large 6-cylinder vehicles with which our readers are so well acquainted.

Speedometers and Police Traps.

LAST week we drew attention to the necessity of motorists, under the present condition of police methods, having reliable speedometers attached to their cars—instancing two cases showing the influence which they have in securing from magistrates a favourable view in alleged excessive speed cases. The instrument employed in the first case, that of Mr. Gray, was, we learn, an Elliott motormeter.

A Wide Awake Town Council.

THERE is a natural tendency towards the rather indiscriminate use of municipal motor vehicles, a fact which is apparently thoroughly recognised by the Manchester Town Council. So they have adopted a proposal to paint in 4-in. white letters the initials of the various departments in which they are used, on every motor car belonging to the town. Whether this will be altogether effective, however, in preventing abuses may be doubted.



We announced recently that Mr. A. Lee Guinness had secured the world-famed 200-h.p. 8-cylinder Darracq racing car, and was bringing her to England. We give a photograph above of this record-holding machine, with engines exposed. Mr. Guinness, we understand, intends to compete with this racing car both in England and on the Continent during the coming season.

Discriminating Magistrates.

Two quite different cases of driving at excessive speed were heard before the Windsor magistrates last week, and it is refreshing to find that they exercised a wise and sensible discretion in dealing with each case on its merits. The first summons was one taken out against Mr. A. W. Morrison, of Camberley, for driving along the King's Road at the rate of 28 miles an hour. Mr. Morrison set up no defence, and said he thought it was quite possible the police were right, as it was a clear road, and he might have been going too fast. He was given an excellent character by Chief Constable Nicholls as a careful driver, and accordingly had to pay the moderate penalty of 20*s.* The other case was that of Herbert Lyon, of Dawney Reach, Taplow, who tore along the same thoroughfare at about 35 miles an hour, his pace being so extreme that Mr. Morrison, who was on the King's Road at the same time, remonstrated with him, observing that it was persons like him who brought motoring into disrepute. In fact, Mr. Morrison himself took the number of the car and threatened to summon him. The Chief Constable stated that he had received many complaints of the defendant's reckless driving, and when his licence was handed up for inspection it was found to be so full of endorsements that there was no room for any more. He was accordingly fined £15, with the option of a month's imprisonment.

Guilty this Time.

A CERTAIN William Austin, who is described as a burly labourer of Chippenham, has recently been convicted and fined £2 with 9*s.* 6*d.* costs, with the option of labouring for a month hard in one of His Majesty's houses of retirement, for placing a number of slate nails on the road with the business ends upwards, the same with intent to puncture motor car tyres. He was once before, it will be remembered, arraigned before the Bucks Assizes on a charge of constructing a novel motor car trap with wire, but he was on that occasion acquitted.

Wreckers at Work.

THROWING stones at motor cars on the part of little boys is not the only form of outrage to which automobile locomotion is subjected, as, one day last week, a deliberate attempt was made to wreck the motor mail-van which runs between Sunderland and Newcastle. A great pile of stones was placed in the middle of the roadway over which the van had to run.

BRITISH EXPORTS AND IMPORTS OF MOTOR CARS, &c., FOR 1906.

NOTE.—In our issue for January 13th, 1906, we published in one table the full figures of British Exports and Imports for 1902, 1903, 1904, and 1905. Prior to 1902, motor cars were not classified separately.

1906.	Imports.					
	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.
		£	£		£	£
January ...	458	175,270	136,720	114	2,889	1,989
February...	530	211,824	184,598	130	3,507	1,511
March ...	600	230,887	184,763	258	7,440	3,556
April ...	591	224,639	178,590	303	8,774	2,895
May ...	508	217,050	176,753	210	6,301	2,780
Total...	2,687	1,059,670	861,424	1,015	28,911	12,731

1906.	Exports, British and Irish make.									Foreign and Colonial Re-exportation.					
	No. of Cars and Value.		Parts Value.	*B.S. Africa.	No. of Motor Cycles and Value.		Parts Value.	*B.S. Africa.		No. of Cars and Value.		Parts Value.	No. of Cycles and Value.		Parts Value.
		£	£	£		£	£	£			£	£		£	£
January ...	146	48,759	16,334	6.825	84	2,112	2,211	637		68	26,999	9,582	4	205	355
February ...	72	19,493	19,838	5,642	44	1,298	1,980	288		39	19,688	5,840	2	65	201
March ...	89	31 814	22,940	4,712	66	2,469	2,372	801		56	28,373	8,203	8	277	420
April ...	62	23,645	16,747	965	61	1,948	2,590	584		83	27,264	11,919	9	292	336
May ...	71	29,356	26,630	3,423	53	2,019	2,268	939		37	14,876	6,820	1	30	246
Total ..	440	153,067	102,489	21,567	308	9,846	11,421	3,249		283	117,200	42,364	24	869	1,558

* *Included* in the totals of Cars, Cycles, and Parts.

NEW COMPANIES REGISTERED.

Gareloch Motor Service Co. (Ltd.), 1, West Clyde Street, Helensburgh.—Capital, £5,000 in £1 shares.

Hurst and Middleton (Ltd.), 38A, Windsor Road, Holloway, N.—Capital, £10,000 in £1 shares. Objects, to acquire the business of a motor car manufacturer, &c., carried on by G. I. Hurst. G. I. Hurst and R. E. Middleton, joint managing directors.

Motor House (Ltd.), Broad Street House, E.C.—Capital, £100 in £1 shares.

Motor Touring Co. (Ltd.), 20, Copthall Avenue, E.C.—Capital. £30,000 in £1 shares. Objects, to carry on the business of manufacturers of and dealers in motor cars, &c., and adopt an agreement with the International Trading Company, Limited. First directors, O. F Spate and J. Levesley.

North British Motor Manufacturing Co. (Ltd.).—Capital. £20,000 in £1 shares. Objects, to purchase the business of the Dumfries Brass and Iron Foundry Company.

Northern Automobile Co. (Ltd.), Oak Lane Garage, Bradford.—Capital, £5,000 in £1 shares. Objects, to acquire the lease and option of purchase of premises in Oak Lane, Manningham, Bradford, lately used as tram sheds and now in part occupation of the Bradford Carriage Company, and carry on business with motor cars, &c.

Warrington Motor Carriage Co. (Ltd.).—Capital, £5,000 in £1 shares. First directors, G. Roger (chairman), F. R. Holding, and T. M. Broadbent.

COMMERCIAL POINTS.

Rover cars, in addition to the excellent results secured in the Brown Trophy and Fromes Hill Competitions, also did remarkably well in the London to Edinburgh run. Two 16-20-h.p. and two 6-h.p. Rover cars got through, all obtaining gold medals. The performance of the two low-powered 6-h.p. cars, in getting through the course within the twenty-four hours, is a matter for congratulation to the makers.

Messrs. Hall, Capris and Company, Limited, who are the sole concessionnaires for the Isotta-Fraschini chassis for Great Britain and Ireland, have taken important premises at 14–15, Riding House Street, Langham Place, London, W. (opposite Queen's Hall), where they have four large floors suitable for catering for all branches of the automobile business, including repairs, which will be carried out by Mr. A. Capris, who for the past six years was foreman to Messrs. Panhard and Levassor. Mr. H. O. Hall, who is a partner in H. E. Hall and Company, of Tonbridge, is the managing director, and will be superintending the orders for Isotta-Fraschini chassis, while the late staff of Messrs. Reading, the old-established carriage builders, will take charge of the body-building department. The company have found it a necessity to take up the carriage work, as they have experienced a great difficulty in the past in obtaining really high-class bodies in reasonable time, often having had to wait three months for delivery.

* * * *

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

14643. 17th July, 1905. Improvements in Brake Mechanism. The Wolseley Tool and Motor Car Company, Ltd., Adderley Park, Birmingham, and Louis Silverman, Crayford Works, Crayford, Kent. This invention relates to brake mechanism in which a brake-ring is expanded within a drum carried by a driving wheel. There are three figures. Fig. 1 is an elevation. A is the revolving brake-ring, such as is fixed to a road wheel of a motor car. B B are separately-formed halves of a ring which may be expanded against the interior of the ring, A, to retard its revolution, and if necessary to bring it to rest. These halves have a common fixed pivot-pin, C. The free end, B¹, of each half-ring, B, is forked, and within each such end is an anti-friction roller, *c*, which is capable of revolving upon a pin, *d*, which passes through and is carried by the sides of the jaw. Pivoted to an arm, H, which turns about the fixed axis of a pivot-pin, *c*, is a block, D, having a wedge-shaped end, D¹, which may be forced by the arm, H, in between the rollers, *c*, and thus force out the ring halves, B, against the interior of the ring A. The arm, H, is operated by a lever, E. Connected with the wedge-shaped end of he block, D, is a yoke, *f*, having hook-shaped ends, which, as the block, D, is drawn in a direction away from the rollers, *c*, press against the lower outer portions of the peripheries of the rollers and draw the rollers towards one another, thus by a positive action withdrawing the ring-halves, B, out of contact with the interior of the ring, A. As the block, D, is forced between the rollers, *c*, the ends, *f*, of the yoke, F, are moved slightly away from the rollers, and allow the ring-halves, B, to be opened out as required. A spring, G, connected at one end to a fixed point and at its other end to an extension, H¹, of the arm, H, ensures that as the force by which the arm has been moved in a direction to force the block, D, between the rollers, *c*, is sufficiently relaxed the arm will be automatically withdrawn sufficiently to bring the portions of the yoke, F, against the rollers and avoid backlash, as the brake mechanism is then operated to draw the ring-halves, B, towards one another. For convenience of adjustment, the yoke, F, is screwed upon a pin, which is carried by the block, D. May 23rd, 1906.

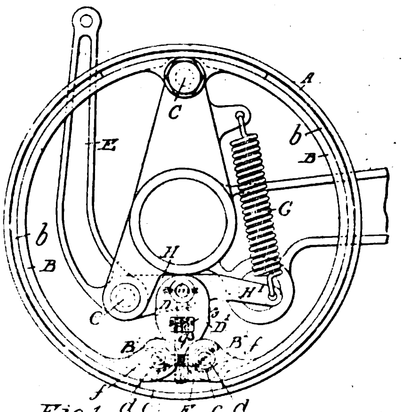


Fig. 1.

24297. 24th November, 1905. Improvements in Carburettors for Internal Combustion Engines. William C. B. Evans, 40a, Deritend, Birmingham, and William S. Cottrell, Penshurst, Richmond Hill Road, Birmingham. The object of this invention is to provide a carburettor of simple construction that can easily be taken to pieces for the purpose of cleaning, and so designed as to be suitable either for the consumption of light oils, heavy oils, or alcohol, it also having a simple contrivance to make it fit to be used for engines of different size. There are six figures. Fig. 1 is a sectional elevation of the carburettor. A is a tube with removable cover, B, and removable cap, C. D is an inner tube with oil inlet, D¹, attached by screws to cap, C. In the annular chamber, E, formed by outer and inner tubes, A and D, is a float, F, with actuating-rod, F¹. A ring, G, with lugs, upon which the float, F, rests, is pivoted at H to interior of cap, C. J is a tube with oil-inlet, K, and closed by screw-nut, L, in which is placed an automatic-valve, M, working on spindle, N, and actuated by spring, O, and ring, G. P is a double cone-tube attached to the top of inner-tube, D, for regulating the air draught. The air is admitted through opening, Q, in cover, R, with diaphragm, R¹, the cover being attached to cap, C. S is a spraying-column which, with needle, T, and valve, V, regulates the admission of oil into the cone-tube, P, for admixture with air entering openings, Q. The needle and valve are raised or lowered by means of a screw, W being a packing gland. The oil enters at K, goes into the tube, J, and enters annular-chamber, E, the supply being regulated by valve, M, ring, G, and float, F. When there is no supply of oil in annular-chamber, E, the float, F, rests upon ring, G, depressing spindle, N, and causing valve, M, to descend and admit a supply of oil; the float thereupon rises, releasing the pressure on ring, G, and spindle, N, and allowing the spring, O, to act and to automatically cut off the supply of oil. The oil then flows into spraying-column, S, through inlet, D¹, and from thence into cone-tube, P, the supply being regulated by needle, T, and valve, V. It is then admixed with air and drawn away by the suction of the engine, the air being admitted through openings, Q, in cover, R.—May 23rd, 1906.

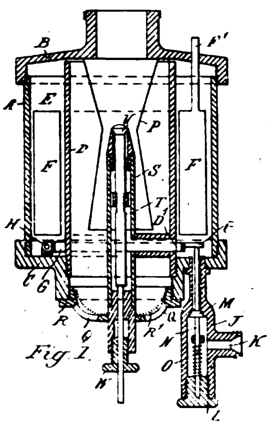


Fig. 1.

Patent Specifications Published.

Applied for in 1905.

Published June 7th, 1906.

17,041. F. J. S. Jones and others. Ignition tubes.
18,245. A. Klumpp. Petroleum engines.
18,962. Elliot Hallas and Sons and C. Hutchings. Driving belts for motor cycles.
19,925. B Brooks. Wrapper for spare tyres.
24,297. W. C. B. Evans and W. S. Cottrell. Carburettors.
24 937. E. D. Cahen. Starting device.
25,443. D. M. Livingston. Radiators.
25,26[illegible]. H. N. Goodwin. Exhaust devices for marine engines.
25,979. A. Westmacott. Starting device.

Published June 14th, 1906.

10,821. W. Baines. Motor cycles.
11,654. A. Schanschieff. Accumulator plates.
11,767. A. Bevilacqua. Tubular steam generators.
12,640. A. Herbert and P. V. Vernon. Reversing gear.
15 997. A. S. Robinson. Wheels.
16,498. C. H. Humphreys and Scowen, Ltd. Controlling mechanism.
17,896. Electric Ignition Co. and F. H. Hall. Electrical ignition.
18,647. S. G. Whitehouse. Steering gear.
18,797. J. P. Stuart. Spring wheels.
19.439. S. Russell. Motor lamps.
19,789. C. J. Bellamy. Steering airships.
19,831. B. Brooks. Boxes for motor tools.
19,853. W. C. Caton. Secondary batteries.
23,857. W. Freakley and R. Bill. Wheels.

Applied for in 1906.

Published June 7th, 1906.

844. F. Wigglesworth and Co. Friction clutches.
2,669. C. B. Hannan. Spring drive.
3,006. P. A. N. Winand. Method of producing a working medium for intl. combn. engines.
3,857. H. S. Broom and J. T. Wade. Vaporiser and carburettor.

The AUTO MOTOR JOURNAL

A Record and Review of Applied Automatic Locomotion.

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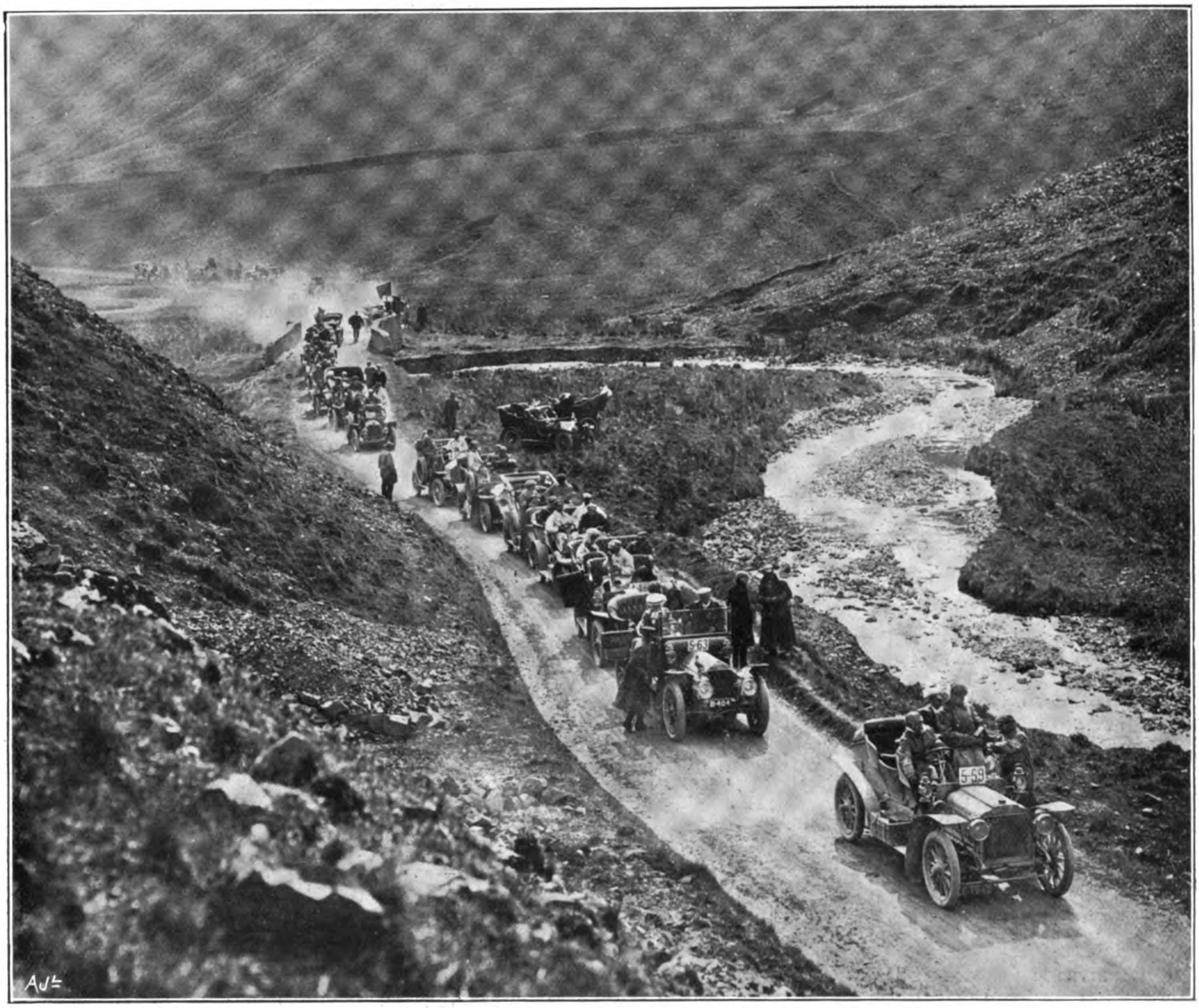

SCOTTISH RELIABILITY TRIALS.—Cars on the first day's run waiting at the foot of Birkhill for the first of the timed hill climbs in the Trial. The three leading cars in our photograph are 25-36-h.p. Richard-Brasier (No. 59), 24-34-h.p. Belsize (No. 63), and 24-30-h.p. St. Vincent (No. 48).

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

British Events.

June 23	South Harting Hill Climb.
June 23	Du Pré Challenge Cup Hill Climb (Derby A.C.).
June 23	Open Hill Climb (Coventry Motor Club).
June 27	N.-E. Lancashire Club Hill Climb.
June 28	Foster Challenge Cup, Non-Stop Run (Notts A.C.).
June 30	Aston Clinton Open Hill Climb (Herts County A.C.).
June 30	Ranelagh Automobile Gymkhana (Ladies' A.C.).
June 30	Speed Judging Trials (Essex County A.C.).
July	Motor Yacht Club Reliability Trials.
July 2	Hill Climb (Wolverhampton A.C.).
July 5	Gymkhana at Wadslay Bridge (Sheffield A.C.).
July 14	Run for Crippled Children (Sheffield A.C.).
July 14	"Henry Edmunds" Hill Climb.
July 21	Motor Union Meeting (Bath).
July 21	Mablethorpe Sand Races (Lincolnshire A.C.).
July 28	Hill Climb (Derby A.C.).
Aug. 6–18	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8	International Cup (Motor Boats) Eliminating Race.
Aug. 9	International Cup (Motor Boat) Race at Ryde.
Sept. 22	Motor Union Meeting (York).
Sept. 27	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

June 26–27	Grand Prix (A.C. de F.).
June 28–29	Kiel Motor Boat Races.
July 8	Motor Bicycle International Cup Race (Austria).
July 14–17	Ostende Meeting.
July 15	Mont Cenis Climb (Turin A.C.).
July 26–Aug. 15	Circuit Européen.
Aug. 13	Ardennes Circuit.
Aug. 18	Coupe de Liedekerke (Belgium A.C.).
Aug. 26–Sept. 2	Brescia Week (Italian A.C.).
Sept. 10	Florio Cup Race (Italy).
Sept. 15–16	Mont Ventoux Hill-Climb.
Sept. 20	Lake Major Motor Boat Races.
Oct. 5–14	Leipzig Exhibition.
Oct. 6	Vanderbilt Cup Race.

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⁂ Owing to the great pressure upon our space this week with the Scottish and Irish and Herkomer Trials, &c., it has been necessary to hold over Correspondence, and most of the regular features of "The Automotor Journal."—Ed.

PASSING EVENTS.

The Scottish Reliability Trials.

The four days' trials through nearly 700 miles of mountainous and picturesque Scotland have been an unqualified success from practically every point of view. They have provided a much needed change of air for manufacturers, agents, and even for tired journalists, and they have been highly beneficial to the development of the automobile movement. There is no question, at any rate, that the development and popularity of the motor car in Scotland will be enormously increased by them, and that purchasers throughout the United Kingdom have been afforded an excellent opportunity of learning the merits of many makes of car. The importance which is now attached to these Scottish trials is clearly shown by the fact that the number of cars entered was twice as great as last year. They cannot but give the general public even greater confidence in the automobile, since many people are more or less acquainted with some portions of the course, and those who only know it by hearsay cannot fail to be struck by the fact that the proportion of cars which safely emerged from the ordeal was most satisfactorily high.

In thus singing a pæan of praise of the reliability trials as such, there may appear to some readers to be a certain amount of inconsistency and some departure from the attitude which we took up when, in advocating the Tourist Trophy, we roundly asserted that reliability trials on the old lines were no longer of any real practical use, besides being hedged round with many practical difficulties of an almost insurmountable character. Truth, however, much more frequently lies in honest contradiction than pedantic adherence to formula. In the present case, however, there is no real contradiction between our attitude now and that which we brought prominently forward last year. In speaking of reliability trials as superannuated, as having taught all that is to be learned from them, and as having become impossible owing to the unmanageable number of cars that would have to travel for many days in succession over ordinary highways where dust clouds would be intolerable, we referred—needless to say—to reliability trials conducted on English roads. On the chosen Scotch highways, with their tremendous turns, over a course, in fact, which would put to shame the terrors of the Auvergne route on which the last Gordon-Bennett race was run, the Scottish reliability trial, although lasting over a very reasonable period, is a real trial of merit, even with modern cars, and would only a year or two ago have been looked upon as too highly dangerous to contemplate.

There are, of course, still the old difficulties of classification, and of instituting a satisfactory system of marking by which every minute of delay on the road can be fairly set off against every mile-per-hour that one car is slower than another upon the hills, and against every additional gallon of petrol that is consumed per ton of weight. And there is also the great drawback that the larger and more powerful cars can only be tested with their engines running light (to comply with the law), except when tackling exceptionally steep hills. But one very important fact that is at any rate brought out with great clearness is that neither the ascent nor the descent of any ordinary hills—however dangerous they may be for other forms of locomotion—has any terrors nowadays for the reasonably careful motorist; or, in other words, that every good make of car is to-day a splendid hill-climber, is quite speedy enough for all practical purposes, and is possessed of brakes which will hold on any hill. The trials themselves are so fully dealt with on other pages that it is quite unnecessary to refer to details here, but it is a striking commentary on the reliability of 1906 models that the 79 cars should have been able to show 198 daily non-stops out of a maximum total possible of 316.

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"The High Barnet Manner."

Unimaginative people would certainly think that our justices of the peace and magistrates between them had exhausted every indignity that it was possible to put upon motorists arraigned before them. The High Barnet Bench has taught us to think differently. They have succeeded in getting a motorist into prison and into a suit of convict's clothes under such circumstances that the moment an application for a writ of *habeas corpus* was made to Mr. Justice Darling he let him out at once. The circumstances appear to have been as follows: Mr. Mortimer, who was treated in this manner, was convicted under Section I of the Motor Car Act before the High Barnet Bench on Wednesday in last week, and he was ordered to pay £10 and 9*s.* 6*d.* costs, or in default of payment to go to prison for one month, which of course means, according to the pleasing provisions of British law, hard labour, though if he were imprisoned without the option of a fine for the same identical offence, he would be put in the Second Division. Mr. Mortimer's solicitor asked for time to pay the amount, but the chairman of the Bench simply replied, "£10 or a month," and Mr. Mortimer not actually having (presumably) the sum on his person, was haled off to Pentonville Prison, thrust into convict's clothes, and kept there till Mr. Justice Darling ordered his release under a writ of *habeas corpus* on Saturday. The legality of the procedure is to be argued before the judge, so that we make no comment on that aspect of the question, but it is evident from his remarks in Court, and from the facilities that he gave by attending to the business at his own house on the evening previously, that Mr. Justice Darling was as scandalised at such an extraordinary exhibition of magisterial harshness as anybody, and when Mr. Moresby White described the proceedings as "high-handed," his Lordship humorously suggested "High Barnet" as the alternative. What makes the whole case so extraordinary is, that there does not appear to have been the slightest attempt to ascertain whether the defendant possessed any goods which could be distrained upon for the fine inflicted or not, and there was a complete absence of evidence that any such attempts had been made. Of course, Mr. Mortimer's case has been taken up by the Motor Union—which body invariably protects the interests of motorists quite irrespective of what their particular position happens to be—but when we recall to mind the leniency which was extended to the Ripley butcher, who practised with his cudgel on Mr. Campbell Muir, the contrast is impressive.

Good May Come. Whatever may be the outcome of the legal argument, and about its results we are not in very much doubt, it is impossible to let things go on in this manner. The Automobile Club and the Motor Union are not likely to leave a stone unturned to see that the law is properly administered, or altered if necessary, so as to prevent the possibility of any automobilist who happens to attend court with insufficient money to pay the fine inflicted upon him, from being haled off to prison and treated like an ordinary convict, subjected to the wet and "dry" baths, and all the other nameless degradations which Mr. Jabez Balfour has been recently describing in such graphic detail. But it throws a terrible light on what has doubtless been done in the past to unfortunates who were not in a position to obtain prompt legal assistance, and whose careers may have been ruined by imprisonment under such circumstances—under circumstances, be it remembered, in which those who framed the particular statute probably never intended imprisonment to be inflicted at all. We believe we are right in saying that there is hardly another European country in which inability to pay a fine inflicted, when a fine is the only punishment, entails imprisonment with hard labour.

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Gentle Persuasion. It will be remembered that the regular crusade made by the police until comparatively recently in the neighbourhood of Reigate, was very far from popular with the inhabitants of the district, particularly the hotel proprietors, and the tradesmen who supply them with goods, and a very emphatic memorial was drawn up protesting against the local persecution campaign. For some time we believe it did good, though there have been frequent relapses, owing no doubt to the avidity of the country districts for fines to alleviate their rates. But it is well that all districts in which these persecution tactics are resorted to, should be made to really feel what the value of automobile custom is. We consequently congratulate the Touring Committee of the A.C.G.B.I. in refusing to recommend the placing of hotels on the club list in districts where police traps are particularly prevalent. The form taken by the resolution referred to is as follows :—

> "That no useful purpose could be served by appointing hotels in districts where the efforts of the police are directed solely to the persecution and conviction of motorists without regard to the public safety, as motorists could not be recommended to pass through or patronise such districts, and that the applicant be so informed."

The effect can hardly fail to be that in districts where the resolution is put into force, pressure will be brought to bear on the mysterious bodies which control the action of the police.

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Woman and the Automobile. There are times when the possession of an automobile enables you to make an exit or escape from a scene with effect and dignity, which would otherwise result in the destruction of both these estimable qualities. We are referring, needless to say, to Mr. Asquith's experiences with the "Suffragettes" at Northampton. After a stormy meeting, in which most of the lady representatives of the cause were ejected from the building, the attack on, or demonstration against, Mr. Asquith was renewed, and looked as if it would result rather badly for Mr. Asquith, when he sprang into his automobile, and escaped from the infuriated ladies without the sacrifice of his dignity—or his scalp.

Motor 'Buses and "Bears."

A NICE little game is being played on the London Stock Exchange, in connection with the Alliance Motor 'Bus Company's shares, which have been put up to a premium of 9½ ! a sure sign that the "bears" have been badly caught. That the ultimate result will bring about the profit which those engineering the little rig anticipate, is not quite so certain as might at first appear, as strong efforts are being made to prevent a "special settlement" in the shares being obtained from the Stock Exchange Committee. Under the circumstances of such a bear squeeze, it is morally certain that the shares are not very much in the hands of the general public. The few real investors would be well advised to make hay while the sun shines—by selling.

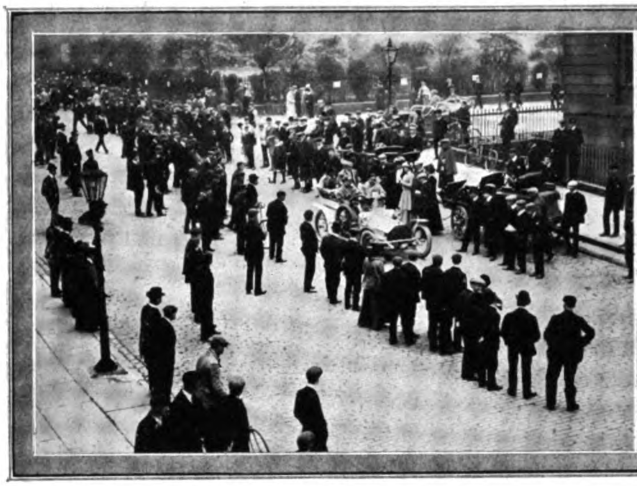
Belated Evidence and Wildest Fiction.

JAMES BEGG, a young motor car driver, was summoned at Westminster Police Court recently for driving in a manner dangerous to the public. The occasion when this was alleged to have taken place was nine months previously, and the witnesses, who were correspondingly imaginative, were made a good deal of fun of by Mr. Staplee Firth, who defended. One of them said that the car came round a corner in Victoria Street at such a terrific pace that he wondered how it could possibly get through, and fully expected to see it lose a tyre in rounding Caxton Street. Mr. Firth rejoined that what was wanted in the way of evidence was something that did not savour so much of fable and fiction. In fact, the nature of the whole evidence was so absurdly suppositious that Mr. Firth summed up the situation with one of his homely little thrusts by observing that "it was just as ridiculous as saying that if a man's aunt had been born a man she would have been his uncle. Unless something happened to show dangerous driving, his Worship could not convict merely on a collection of 'ifs.'" His Worship agreed and dismissed the charge.

The A.C. de France Desires Reciprocity in Contests.

AN important decision has been taken by the A.C. de France in connection with races and contests organised throughout the world under the auspices of recognised clubs. For the future they have determined that they will officially go into the details of, and carefully consider, all the regulations issued in connection with automobile contests under the auspices of recognised clubs, from whatever country they may emanate, and they propose to see that all regulations are carefully observed so far as they affect any French cars which may be entered. The Club propose to notify officially to the public and to manufacturers the events which they approve and recommend, and their guiding principle in this will be to refuse approbation of all events in which they are not permitted to have a commissioner who will be admitted to the "inner ring" of the contest to watch the interests of the French entrants, but, of course, without a right to vote. By way of a set-off, the French Club propose to extend the same facilities to all recognised foreign clubs who wish to be represented in connection with any French events organised by or under the control of the French Club. The whole of this question is to be officially brought up by the A.C. de France at the International meeting of the delegates of the clubs, at Pont de Gennes on June 25th, a meeting which promises to be epoch-making, as at the same meeting the whole matter of the resuscitation of the Gordon-Bennett Cup Race is to be considered.

SCOTTISH RELIABILITY TRIALS.



Scene at the start of the Trial in Blythswood Square, Glasgow, on Wednesday, June 13th. The 18-h.p. Arrol-Johnston car just being dispatched.

In High Street, Dumfries, on the first day during luncheon time. The competing cars in the city "garage."

HOW THE TRIAL WAS RUN.

A glorious four days' holiday through Bonnie Scotland at her bonniest, when Nature in the Highlands decks herself in a "Yellow Cover" of golden broom; two or three hundred faces reddened by contact with keen breezes from snow-capped mountains, then bronzed under a dust layer by a baking June sun; a hundred keen business competitors meeting to contest for superiority only to part four days later the best of good friends with one another; four score of motor cars attempting to settle their rival claims to supremacy, and succeeding only in proving that supremacy belongs to the motor car itself rather than to any particular make; a marvellous exhibition of official administrative ability, almost accomplishing the impossible feat of pleasing everybody. Such was the 1906 Scottish Reliability Trial.

To tell the story of how the Trial was run, looks at this stage an impossibility. Bits of exquisite scenery which at first sight left, what we foolishly supposed to be indelible impressions, absolutely forgotten by the constant recurrence of still more delightful spots of beauty; incidents in the early stages of the tour which so impressed themselves that it seemed ridiculous even to jot down a note

SCOTTISH RELIABILITY TRIALS.—The climb up Birkhill on the first day. General view of the cars at the foot of the hill, as seen looking up the ascent. Our frontispiece this week gives a striking view in the reverse direction.

about them, similarly crowded into oblivion by others equally exciting; performances of individual cars which struck one so forcibly that a whole column would hardly suffice to describe them, repeated and duplicated over and over again by the performances of other cars, equally smooth, equally silent, and equally perfect. Such is the difficulty that confronts the recital of the story.

One impression, however, stands out bold against the background of four days of pleasant experience. This is the admirable way in which the affair was managed. To the Scottish Automobile Club, and more especially to its courteous secretary, Mr. R. J. Smith, British motoring owes more than mere thanks for the object-lesson afforded by the Scottish Reliability Trial. It was perfect as clockwork from start to finish. And throughout the long and trying ordeal, Secretary Smith was the very personification of courtesy to everybody, the last man on the ground a stranger would pick out as "boss of the show," yet withal possessing as firm a grip on every thread of detail as the racing motorist has on his steering-wheel. There was one point, however, in which a slight improvement might have been effected, namely, in the Press arrangements. As it happened, Mr. Smith provided a seat on a competing car for every Press representative on the ground, even allowing individual Pressmen to exchange places from day to day, notwithstanding that such exchanging, owing to the variation of weights involved, must have seriously complicated the mathematical difficulties of judging individual performances. But all this might have been avoided, and the purposes of the correspondents themselves much better served by providing a few cars, or even a motor 'bus, for the exclusive use of the Press. In this way it would have been practicable to obtain a better perspective of the whole affair than was possible from a seat in the tonneau of a competing car. However, as I was a passenger on four different cars, on as many days, I can only describe what came under my personal observation, as follows:—

The 20-h.p. Straker-Squire touring car (No. 83), with Mr. Sidney Straker at the wheel, climbing up Birkhill. The starting point is where the group of officials is seen standing.

The 30-h.p. Rolls-Royce (No. 24), driven by Mr. Claude Johnson, just after the start to ascend Birkhill.

SCOTTISH RELIABILITY TRIALS.

The First Day—Glasgow to Edinburgh.

"Car No. 4-83, Straker-Squire 25-h.p." So read the official ticket I received assigning my place as a passenger for the run. The allotment was not exactly to my liking, let me say at the outset. Somehow I associated Straker-Squire with a London motor 'bus, and the suggestion of four days sitting over the nerve-destroying and ear-splitting racket of a London motor 'bus was anything but assuring. Yet never was I more agreeably disappointed in my life, as I took occasion to say to Mr. Straker, who was driving, and to Mr. Thompson, manager of the firm's pleasure car business, many times before the day was over.

We were the last but one to start, our numbers indicating the order of departure—eighty-four being the highest on the list. This gave us an excellent opportunity to look over the double rows of cars which stretched around Blythswood Square, Glasgow, the lower numbers alongside the railings of the garden enclosure, and the higher numbers following in rotation near the kerbstone. At seven o'clock the first car left the Square, but it was seventeen minutes past eight before we got the word to "Go!"

Once clear of the city streets, and out in the fresh open country, our first care is our route book, which directs us in regard to every cross road, fork, twisting, or turning likely to lead us astray. But with eighty-two cars ahead—no, seventy-six, for six failed to show up at the start—there is no occasion for a guide book when the smooth road is ribbed with the trail of hundreds of broad rubber tyres. So we use our guide book to make notes on the margin, like Mark Twain's fellow passengers aboard ship in "Innocents Abroad."

All the observers selected by Mr. Smith are Scotchmen, or Scotsmen, or Scots—for the life of me I don't know which is correct, and during the last few days I have heard all three used indiscriminately. Our observer on the Straker-Squire was exceedingly pleasant, and, better still, very well informed. While we are wrestling with the pronunciation of Pollokshaws, Strathbungo, Crossmyloof, and Malletsheugh, all of which occur in print on the very first page of our guide book, our observer is calling our attention to the fact that we are in Bobbie Burns' country (I wish I could write it as he spoke it, it sounded ten times more musical).

Listening to an enthusiast who can talk well, and who can illustrate his lecture by pointing to the places themselves where the rollicking poet lived, is worth a hundred pages of dry guide book reading. So we listen and listen. Even the Straker-Squire motor, which has not been making any noise worth speaking of up to now, settles down to a steady murmuring hum, as though it was, too, interested in catching every word.

At Ayr we take our first time record, and find we have done the first 32¾ miles in exactly 1 hour and 47 minutes, which is the legal minimum to a second. We have only got to keep this up and the Scottish Reliability Trial is settled.

"The Auld Brig of Ayr," our observer guide remarks, as he points to a most charming old bridge, dilapidated and crumbling, were it not for the kindly crutchlike scaffolding which admirers of the farmer poet have erected to preserve as a monument of his memory.

But here is Wallace Tower, Tam o' Shanter Inn, and even a statute of Bobbie himself, which we meet and pass almost before we have time to follow the direction of our guide. And over to our right, that lovely stream which has been coming and going in its wanderings through the meadow, is the Bonnie Doon herself, whose banks and braes proved such an inspiration to the poet.

"Oh, if Bobbie Burns had only known what a glorious thing it is to ride in a motor car through this beautiful country!" observes Mr. Thompson, who is rather poetical for a motor salesman.

"He would probably have drowned himself in the Bonnie Doon the first time he took the car out," is the sardonic comment of our

SCOTTISH RELIABILITY TRIALS.—The 16-20-h.p. Argyll Car (No. 17) well on the way up Birkhill.

matter-of-fact driver, as he opens the throttle a bit wider, and we go skimming along towards the little mining town of Dalmellington.

Our first greetings from school children, who are given a holiday to scream welcomes to the passing cars, and less noisy demonstrations from sooty-faced miners marks our passage through the town.

"Proceed to ascend some miles to the moorlands," is the way the guide put it. Whoever laid out this road must have had reasons of his own, and not very suggestive of sobriety either, for laying out such a wobbly stretch. It certainly argued well for the level-headedness of the seventy odd drivers that they were all able to travel it without going dizzy. If Bobbie Burns used it as a favourite walk, it certainly explains the unkindly stories told about his "making w's" in walking.

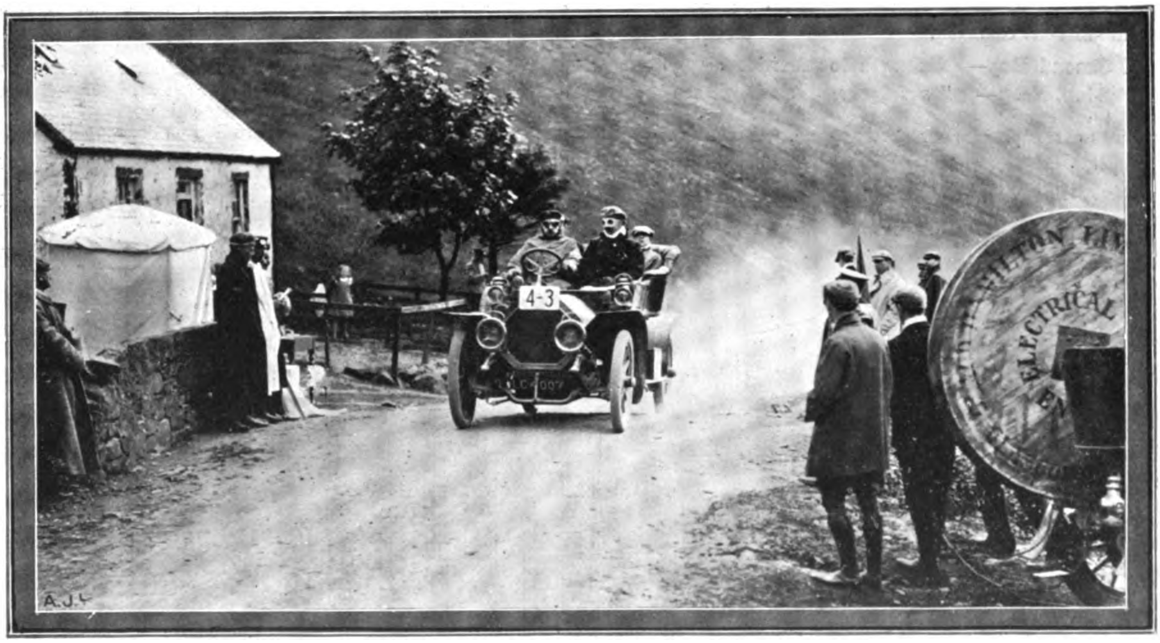
But we have no time to stop to moralise. The winding, twisting road comes to an end sometime, and we afterwards find that it is a mere fleabite of a twister as compared with some of the serpentine, endless tracks in store for us.

Another case of timing at St. John's Town of Dalry finds us again on the very dot of time, and we are figuring out how long it may take us to reach Dumfries and luncheon. This moorland air certainly sharpens one's appetite, and the 25 miles before luncheon cannot pass too quickly.

More history and poetry as we reach Maxwelltown, of Annie Laurie fame. We are still humming the old, sweet air when we reach Dumfries, and the crowd in the street directs our way as through an open canal of humanity to the town garage.

An hour for luncheon, during which we compare notes with earlier arrivals and express condolence with the few who have had their first taste of tyre troubles. Then off again for the first hill climb of the run at Birkhill. We have heard so much of the terrors of these Scottish hills that we are all anxiety to get there. We can only bestow a passing word of admiration for the lovely landscape around Moffat, and are off again for the foot of the climb.

Distance certainly does not lend enchantment to roads up hills. Quite the contrary. The road up Birkhill looks forbidding as we fall in behind half-a-dozen cars waiting their turn to go up. Signalmen with red and white flags establish communication between the foot and the summit. If a white flag is waved it means the road is



SCOTTISH RELIABILITY TRIALS.—At the finishing point for the Birkhill Climb. The 18-h.p. Gladiator (No. 3) just finishing. Note the electrical cable apparatus, fitted in the motor car, on the right of picture, which formed part of the timing scheme for the hill climbs.

SCOTTISH RELIABILITY TRIALS.—Cairnwell Hill Climb. Second day. The 12–14-h.p. Argyll (No. 15) waiting the word to "Go."

clear for the next car, but if a red flag, that signifies the last car has got stuck. All this we learn afterwards when we came to hills that were really hills. But Birkhill—it is a long climb, of 1 in 17, but we forget it before we get to the end of the journey.

At the top of the hill we see our old friend, Harry J. Swindley, acting as timekeeper, and wonder how ever he got there. We envy him the experience of seeing cars stuck, and begin to wish that we too had got off and waited for the others to come along.

But "Captain" Straker is inexorable. He must push along to Peebles and Edinburgh, no matter what our feelings may be. Even when the wind a few miles further along the road whips off his cap and goggles he does not even slow down, but just sails along as though the afternoon breeze, which is already growing chilly, was exactly what he came for.

Edinburgh is *en fête* over a bicycle parade, as we reach the garage for the night. Young men and young women in carnival costume are parading the cleared streets. All but the pressmen, among the reliability tourists, proceed to a hasty wash up, and dinner, and then take in the sights of the show. But pressmen who have to grind out "copy" find their work begin, asking questions of every fresh arrival of incidents or accidents on the road, and then pegging away until bed time to get off their despatches to let the world know how the first day came out.

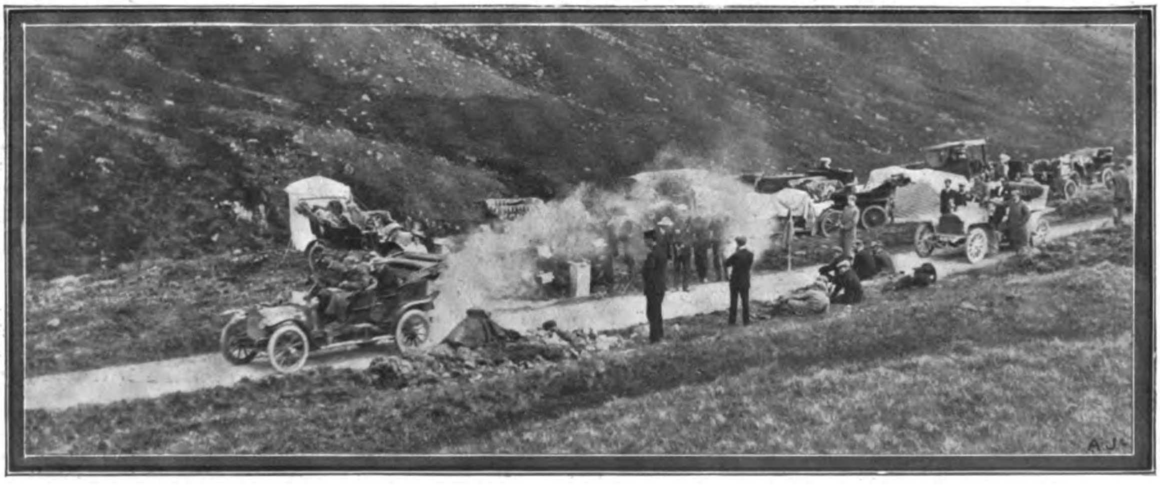
Second Day—Edinburgh to Aberdeen.

"Spyker 28-h.p. No. 3—79" was the lucky selection I made for the second day.

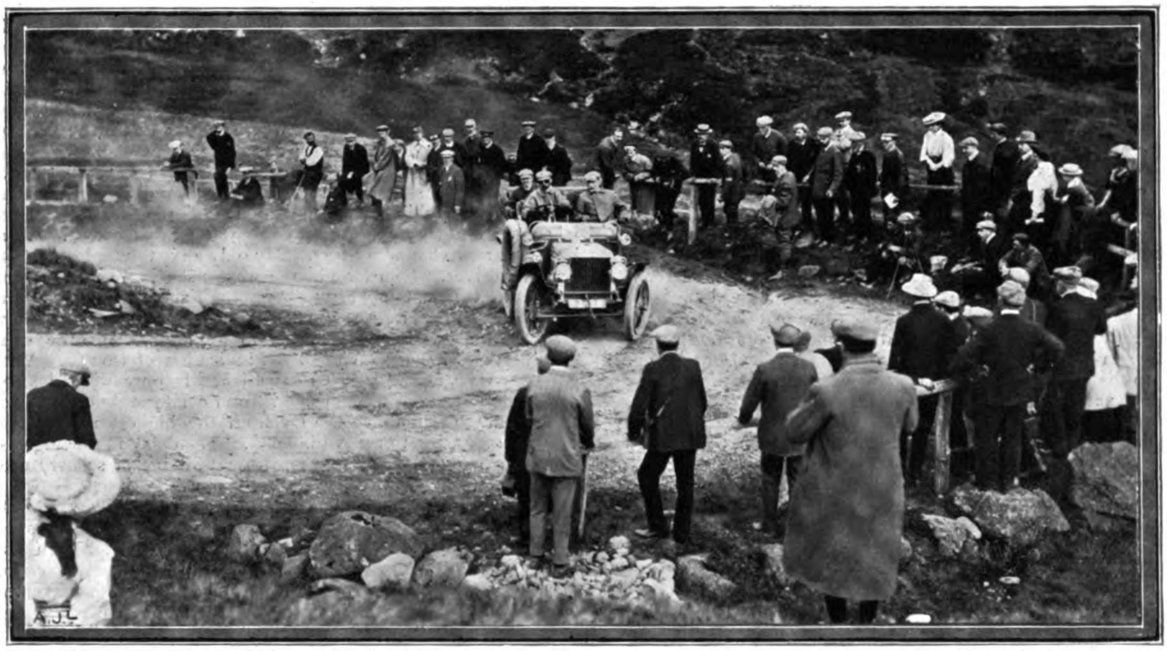
Two minutes past eight was our starting time, which meant that sixty-one cars, or one a minute since seven o'clock, were on the road ahead of us. With a good car beneath us, and the Spyker certainly deserves the title, who cared for sixty or a hundred and sixty cars ahead, as we passed out of the most beautiful city in Great Britain, and headed north towards the Highlands. The sky, which had been cloudy ever since leaving Glasgow yesterday morning, began to show signs of rain. But it never got beyond this stage, more's the pity. For long before we reached Stirling, the first control 35 miles away, every driver in that long string of motor cars would willingly have yielded a hundred points for half an hour's good heavy shower.

It was the irony of fate which associated the dustless Spyker with that most troublesome part of the whole trip, from Edinburgh to Stirling. For every blessed inch of that 30 odd miles was one long tunnel of dust, through which we drove and choked with no possibility of escape. The Spyker may have been dustless as a steam roller, or it may have been a very simoon generator for all we could tell. We simply ran into dust as the cabs and tramcars run into fog in London. A 1,000 horse-power electric fan could scarcely have blown a hole through that dust-cloud. It may be imagined, therefore, what earthly chance we had against the insidious gritty particles which reduced us to the condition of street sweepers before we had gone five miles.

One advantage, however, accrued from this dusty nuisance. If it took our attention off the surrounding scenery, by forcing us to dodge the thick spots in the dusty atmosphere, it also gave us an opportunity of judging the other cars which passed us, or were passed by us, in our mutual efforts to find an occasional oasis.



SCOTTISH RELIABILITY TRIALS.—The hill test up Cairnwell, the 14–22-h.p. Germain (No. 19) just started, Mr. Ramoisy driving.



SCOTTISH RELIABILITY TRIALS.—A sharp turn and a splendid bit of driving on the Devil's Elbow by the 30-h.p. Daimler (No. 26), Captain F. B. Wentworth at the wheel.

But dust clouds have an end, as we discovered after we had passed Stirling, and left behind us that splendid memorial of the past, the Wallace Monument, silhouetted on the hill-top against the sky. We breathed freely again for a mile or two, but caught the dust once more between Stirling and Perth, and from there on to Cargill, where the famous grove of beeches tempted us to linger awhile among the crowd of holiday-seekers who braved the dust to cheer us in passing.

Blairgowrie at last, and luncheon. Never was meal more welcome, not to speak of the opportunity to get rid of the cake of dust which filled every pore of one's skin, filled one's ears, and turned moustache and hair to a dull, musty brown.

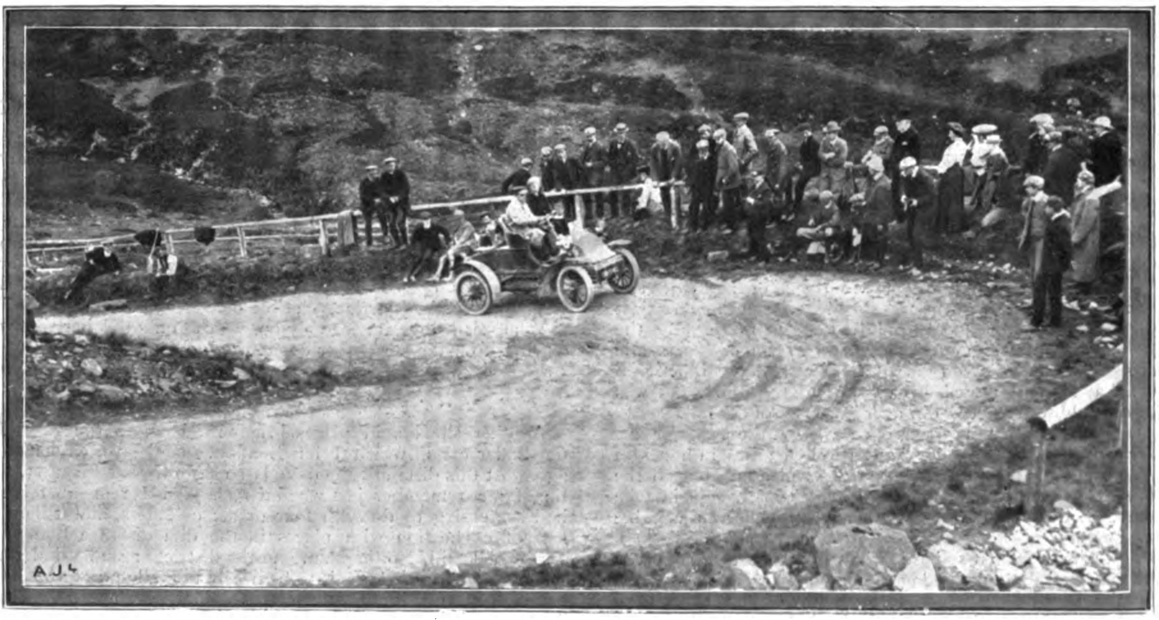
Eighteen miles to Spittal of Glenshee, where the ascent to Cairnwell Hill really commences. We begin to leave civilisation behind as the winding road mounts higher and higher into the moorlands, where sheep and cattle and wild birds are the only living things. At the Spittal of Glenshee Hotel, a pleasant crowd of summer residents stand on the hotel verandah waving us godspeed on our journey towards the clouds. A mile or so ahead we espy a number of cars standing in the road, so we slow down, knowing that we must be near the hill climb.

When we come to a halt some minutes later we find we were never more mistaken. A string of cars a quarter of a mile long stretches before us to the bend in the hill side, where the road disappears.

The cars ahead, however, are nearly all empty, drivers, observers, and passengers having gone afoot to the scene of the hill climb. We follow. At the corner of the bend in the road we see another string of waiting vehicles, thirty or forty in number, all empty. A yellow flag in the distance shows where the timekeepers are seated at the beginning of the climb, and a few hundred yards further we can perceive quite a crowd of spectators gathered on a lofty knoll, where the road and skyline meet.

"Surely that can't be the climb, up to that rocky shelf?"

But sure enough it is. Even as he spoke we perceive a motor car struggling gamely as it emerges from the dim perspective, and

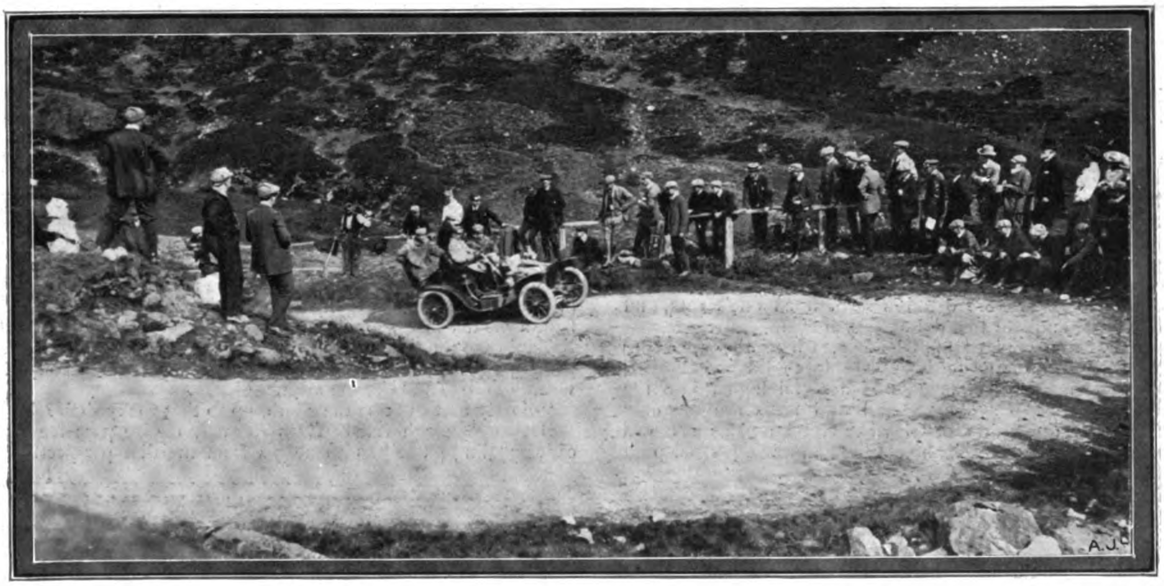


SCOTTISH RELIABILITY TRIALS.—The 9-10-h.p. Adams-Hewitt (No. 41) coming well round the Devil's Elbow up Cairnwell.

or a few seconds stands sheer against the sky, tugging with all its power against an ascent that looks at this distance precious close to the perpendicular. As the car disappears over the crest of the hill a white flag flutters from above, and a minute later another car forges ahead along the last stretch of yellow road, which seems to lead to nowhere. It is a long drag for a man afoot to reach the Devil's Elbow from the place where we left our car. This Devil's Elbow certainly deserves its name. It is as fiendishly crooked as that gentleman's hind-leg, and the driver of a car that misses its footing or slips its brakes on the turn of that elbow would have a very forcible illustration of why Hades is always referred to as down, down, as he slipped back into that awful gorge a thousand feet below. The Devil's Elbow is a crook in the road, shaped like the letter Z, only reversed. The mountain slope is to the left as you ascend, so that the bottom line of the Z would be represented by a stretch of 200 yards or more from the starting point. The last dozen yards go up at a grade about one in ten. The turn to the left comes back to a grade of one in seven, and after about thirty yards of this—most wretched crumbly roadbed it is, too—it turns abruptly to the right at a grade of about one in six.

The guide-book says, "Watch the sharp turns on the Devil's Elbow," a delicious bit of Scottish humour.

Just as we reached the second turning, that is, by walking up the hill-side, the 30-h.p. Daimler got the word at the start to "Go!" Romping uphill as though it were dead level, the powerful British car comes like the wind up to the very corner of the first turn, which it took on third speed. A dexterous twist, and the grey radiator was charging full tilt up the steepest portion of the ascent. A second's hesitation, and the driver had changed into second speed, a change the motor acknowledged with a roar of gratitude as it recovered its breath for the stiffer climb. But it was easy, so easy indeed that, at the next turn, the driver actually jumped back into third as he made a wide sweeping turn of the bend.



SCOTTISH RELIABILITY TRIALS.—The Devil's Elbow on Cairnwell. The 10-h.p. Darracq (No. 28) taking this trying bend.

The turn was just too wide, for the big car skidded her front wheels into the six-inch deep gully on the hill side of the road. For an instant it looked as though the wheels might be smashed against the jagged rocks which stood out from the hill side there. But the driver was a man of nerve and cool judgment. Quicker than people could realise the narrow shave from an accident he had slipped into second speed again, had pulled his car out of the ditch, and was humming cheerily towards the dip over the crest of the hill.

A ringing cheer from the spectators rewarded the performance. It was a thrilling bit, such as they had travelled miles in hopes of seeing. To the spectators it was more or less pleasant, but to the competitors who had trudged uphill to made closer acquaintance with this wretched Devil's Elbow it was anything but a pleasurable spectacle.

"If a big Daimler finds it so hard, what price my car?" observed one driver who had been explaining to everybody who would listen that the carburettor he had put in for economy of petrol consumption had been playing the very mischief with his car on the hills.

Following the Daimler came the 6-cylinder Rolls-Royce, which is taking part in the Trial as incidental to its match with a 4-cylinder Martini. Mr. Claude Johnson, who had driven the car from London, was at the wheel. He looked serious enough, as every driver did when the first turn in the elbow was reached. But his car never faltered an instant. Steering a straight course in the middle of the road, even up the second and uglier turn, it sailed away with a lot in hand up to the hill-top, where the man with the white flag had already signalled another car to come along.

Watching cars climb a wretched spot like this is one thing, but climbing it yourself in a car is another. And of the two I must confess that watching is far the more thrilling. So at least I found it, as we eventually got word to bring the Spyker to the starting line—after two hours' waiting. My only anxiety was lest our young Scottish driver, whom I could see was exceedingly nervous, might lose his head at the wrong moment. But Vaughan, who had a "watching brief" from the maker's London office, was on the alert for such an emergency, standing in the tonneau at the driver's shoulder, ready to act on the least indication of trouble. Yet the good car was after all its own salvation. It only wanted steering and it did the rest, landing us easily and comfortably out of reach of danger, 2,300 feet above sea-level, on the highest road in Great Britain, according to the guide book. The delay in starting cost us our chances of admiring that most beautiful bit of scenery around Braemar, which Queen Victoria loved so well.

At best we could only hope to reach Aberdeen by nine o'clock, which meant the probability of finding telegraph offices closed and no chance of sending despatches that night. Yet hasten as we might to reach the stopping place, it was impossible to resist thoroughly enjoying the hearty Highland welcome that greeted us along the road. To be pelted with bouquets sounds pleasant, but when those bouquets take the form of huge bushes of yellow broom, flung at you when you are travelling, let us say, twenty miles an hour, and the stick of the bush chances to catch you in the face, well, it takes some of the poetry out of it. But we find compensation in reading the merry little messages we discover tied around the brambles, one of which we read as follows: "I wish you first to Glasgow. Ruby Morrice, The Kenser, Dennet."

Whoever Ruby Morrice may be, we can only tell her that we did our best to make her wishes come true.

Third Day—Aberdeen to Pitlochry.

"Car No. 5.—24-30-h.p. Rolls-Royce."

Another shuffling of places brings me back to the Rolls-Royce 6-cylinder car in which I left London, some days, weeks, or years ago. At this distance, the date is so far off that I cannot, for the life of me, remember just when it was. All I remember is that it had something to do with four or six cylinders, and it bore some sort of connection with places in the dim distance like Oxford, Dashwood Hill, Nottingham, and the district around Windermere.

Once again our luck is to be nearly the tail end of the line. I seize the opportunity to send off a preliminary message or two, as I am by no means sure that I shall have a chance to do so at noon. The delay nearly costs the car some marks, as we get back to the garage just as they are beginning to grow nervous about our absence. I

SCOTTISH RELIABILITY TRIALS.—The third day. Bridge-of-Avon Hill Climb. At the starting line. The 12-15-h.p. Arrol-Johnston (No. 4), Mr. E. A. Rosenheim driving, waiting for the word to proceed.

speak in the plural, because my old friend Douglas Miller was seized with the same inspiration to utilise the hour and a quarter wait, and we both came within a minute of being late.

Mr. Claude Johnson, who has driven the Rolls-Royce from London, and who still holds the wheel, is one of those thorough sportsmen that nothing seems to ruffle. He is cheery as on the morning we left London, and has a fund of pleasant anecdotes about incidents on the trip.

Immediately behind us is the big Benz car with its German driver and German passengers, which we have dubbed the "Invasion of 1910." It carries a combination of horns, in the shape of a siren blown by the exhaust, and a triple-barrelled trumpet, which the young man, who looks like Prince Henry's brother, "tootle-tootles" as we pass through villages. It is a pleasant musical sound that tootle-tootle, while the siren screech is most appalling. There is no denying that these Germans do things properly when they start, and we envy them their thoroughness while admiring their effect.

Guide books, which were so carefully margined on the first day's trip, have long before this become fluttering, grimy, tattered sheets, when they have not blown away by pages at a time. What is the use of jotting down impressions of scenery? We have long ago become first intoxicated, then surfeited, and now are almost indifferent to it.

These bright-eyed rosy-cheeked Scotch laddies, we have surely known them all their young lives. The kindly-faced old women and the weather-beaten old men, who stand at cottage doors to wave us pleasant greetings, are our oldest friends. This long sweep of mountains on either side, where the yellow road can be seen miles and miles ahead of us, is where we have spent most of our time since we can remember. Even this Scotch mist, or what we would call a drizzling rain if we were still in a barbarous city with tramcars and all the rest of it, is the most glorious thing in the world to freshen one up after the loss of sleep. The keen mountain air fills one's lungs and thrills you like old wine. And by-the-bye, talking about thrilling you, there's Scotch whisky.

"Yes, I don't mind if I do," Mr. Claude Johnson sings out over his shoulder, in response to an offer of my flask. I reciprocate his "good health" on the return of the flask, and then I learn something new about the distinction between Scotch and Scottish.

"Scotch is the right word," our observer informs us. "We say Scotch whisky and Scotch lassies, both to be spoken of in the highest terms of praise, therefore Scotch. But Scottish is the canny mon who is cantankerous and bites his words in two." Our observer is himself an importation, and talks with a strong foreign accent. I suggest that he, too, may be part of the invasion of 1910 sent over by the owner of the mailed fist to get acquainted with the country and its motor cars by acting as official observer. He assures me, however, that he is a Frenchman, and there is nothing for it but to take him at his word. Still, his intimate knowledge of Scotch and Scottish sounds more like a prying German than a light-hearted Frenchman. While we have been discussing this our 6-cylinder car has been eating up the Highland roads, and here we are at Tomintoul where the morning's hill climb takes place.

It is a most delightful spot where we pull up to wait our time for the climb. The Bridge-of-Avon it is called, one of those hump-backed stone bridges with a "thank you ma'am" in the middle where your car prances like a child's rocking-horse in crossing. Another peculiarity of these bridges is they are always at right angles to the road both approaching and leaving. Unless the driver makes a good straight shot with his front wheels, it is a case of a broken radiator, or into the river.

While we are waiting our turn, we hear the story of a jam which occurred on that bit of perpendicular road on the other side of the bridge, which looks from here as steep and sheer as the side of a house. It seems there was a small Maxwell car stuck on the hill, then a Mass car followed, and behind it came a Cadillac, an Argyll, a Daimler, and, I think, another car—all on the hill about the same time. The Mass car, in trying to escape the Maxwell vehicle, which was stopped, missed his gears and slid backwards. The rest, who were following, scattered to avoid collision, one car being within an inch of going over the precipice. The Mass car steered backwards into the bank, overturned, throwing its observer into the roadway, but fortunately inflicting no serious injury, and leaving the car and its occupants without a scratch. The car had been righted immediately, and succeeded in climbing this hard bit without difficulty. The little Cadillac, which jammed on brakes at the toughest bit of the climb, opened up again as soon as the road was clear, and tugged away to the top like the brave little chap it is. All this we learnt piecemeal. The details may not be exactly right. But as every man who was there tells a different story of how it occurred, I think mine may be taken as historically as accurate as the rest.

"I'm afraid your weight may stop us," Mr. Claude Johnson informs me, after we have visited the spot by way of preliminary "sizing up" its difficulties. Out of respect to the Rolls-Royce car, let me hasten to explain that this was only a joke on myself, which everybody seemed to enjoy ever since I had received the record-breaking "passenger's weight ticket," showing a gross weight of 19 st. 1 lb. for myself and bag. I had no idea my bag was so heavy, although it is a nuisance to carry.

Yet it was a wretched little climb, that hundred yards of 1 in 5, with an awkward jolt half way up, and a crumbly road surface of loose stones all the way. But the Rolls-Royce took it as though she had been fed on "one in fives" instead of petrol, and presently we were sailing up hill to another yellow flag, which marked the beginning of the official hill-climb. But from start to finish there was nothing in it to compare with that awkward bit just over the bridge, and before we knew it we were again hailing the "man with the watch" at the summit of the hill, and answering his congratulations at our good performance.

We have scarcely time to compare watches and jot down the time—my note flew away when the page was ripped out of the book somewhere on the Grampians—when we are confronted with another teasing bit of road, which the guide-book underscores as dangerous, and warns cars to keep apart at this descent, and take it at very slow speed. It is a horrible drop, almost sheer, and like all such bits it turns abruptly at the bottom over one of those crazy stone bridges with a lump in the middle.

A man with a red flag stands at a bend in the road waving to warn us of the danger. Mr. Johnson applies brakes, and is cautiously picking his way down, when we hear the "toot-toot" of another car behind us. It is a sickening sensation, that of dropping down a steep hill, but it is doubly sickening to feel that there is a big heavy car behind you, and if something breaks the chances are that you will catch it both ways, in front and behind.

Thank goodness, that is past, and we are now scooting for all we are worth down the bumpetty, twisting, switchback road that brings us to Grantown-on-Spey and luncheon. A capital luncheon, too, we find awaiting us, with bonnie Highland lassies to wait on us. We are hungry enough to eat both, but the lassies save their lives by the plenitude of the menu.

All aboard again for a seventy mile drive from Grantown to Pitlochry. More winding roads, where for miles our only spectators are black mountain cattle or timid sheep and lambs. Now and again we disturb a grouse into awkward lop-sided flight, or come across a meadow where plovers by the hundred are attracted by what look like daisies in the grass. Mile after mile of rolling billowy mountain tops, with a background of higher peaks, where patches of snow still linger in the hollows in spite of sun and rain. Beautiful, clear patches of water, land-locked lakelets high up in the mountains, with no apparent inlet or outlet. How that water ever got up here is a mystery. But everything is a mystery at this altitude. That mountain side yonder, which looks like the emptying of a giant's bucket of mud, or those still, blue mountain tops in the distance, where the fires that lighted the world before there was any sun or moon have left their mark, or this eternal succession of green and brown land waves, monstrous and awe-inspiring, yet limitless as the waters in mid-ocean—it is all a mystery, and one we certainly cannot stop to unravel if we hope to reach Pitlochry in time to-night.

SCOTTISH RELIABILITY TRIALS.—Major J. W. Fraser's 10-h.p. Argyll (No. 82) just commencing the Bridge-of-Avon ascent.

For twenty miles we have been making a gradual descent of the Grampians, and now we find ourselves once more in that delightful mixture of forest, mountain, and lake which constitutes Scotch scenery. It is too good to be dubbed Scottish, so let it go as Scotch.

These are no longer village peasants who greet us by the roadside. The bonniest of bonnie Highland lassies, picturesque in Tam o' Shanter and trim walking suits, and straight-limbed, clear-eyed lairds (I suppose that is the right word for it) give us a courteous reception from terrace and garden in the trim villas we pass.

A noble gateway, surmounted with a ducal crown and the single initial, A, marks the entrance to Blair-Atholl, one of the earthly paradises belonging to the Duke of Atholl. At every foot the surroundings grow more luxuriously beautiful. Not since we slipped through Braemar have we seen anything to compare with this. It is a dream, and before we have time to appreciate it, our car is at the storage depôt at Pitlochry, and there is a rush to secure rooms.

One of the tourists, a heavy-weight passenger journalist, had forgotten to book his rooms ahead before starting at Glasgow. He therefore wired the first day to a friend in Edinburgh, to Mr. Douglas Croall, to be exact, asking him to use his personal eloquence and influence to secure a room and bath at the N. British Hotel. Mr. Croall did so, and the heavy-weight journalist got his room and bath at Edinburgh. "What is the best hotel at Aberdeen?" he inquired from the hall porter at Edinburgh." "The Palace, sir."

Taking a telegraph blank, the heavy-weight passenger wrote a despatch to the Palace Hotel, bespeaking the very best room and bath the house possessed for himself (giving his name), and adding, "The best in the house is not too good for him." This message he signed with the name of the manager of the N. British Hotel before sending it. On reaching Aberdeen, he had no difficulty in securing a room at the Palace Hotel, although the landlady informed him that she had refused it to a dozen people in the last hour, and that it was the only available room in the house. "Kindly give me a telegraph blank, please," the heavy-weight guest asked, after being assigned to his room. "What is the best hotel at Pitlochry?" he asked. "Fisher's."

Then and there he filled out a message to Fisher's Hotel, "Please reserve best room in the house, bridal chamber if necessary, for Mr. Blank, of London. The best you have in the house is not too good for him!" "What is the name of the manager of this hotel?" he inquired. "You don't mean to say you wrote that telegram from Edinburgh yourself?" inquired the landlady. "Precisely, madam," replied the unabashed heavyweight. "Shall I simply put 'Manager, Palace Hotel, or mention your name?'" "Manager will do; no, better mention my name, McKilliam. I like your nerve, I must confess, and if it gets you a room at Pitlochry so much the better."

It did. But it took a lot of sifting before we discovered that our friend, J. C. Percy, of Dublin, had a double-bedded room where an extra heavy-weight could be stowed away without provoking a riot. Before retiring, however, I explained to the genial manageress of Fisher's, that Mrs. McKilliam, at Aberdeen, would certainly feel deeply obliged for her ready compliance with her telegraphed wishes.

Fourth Day—Pitlochry to Glasgow.

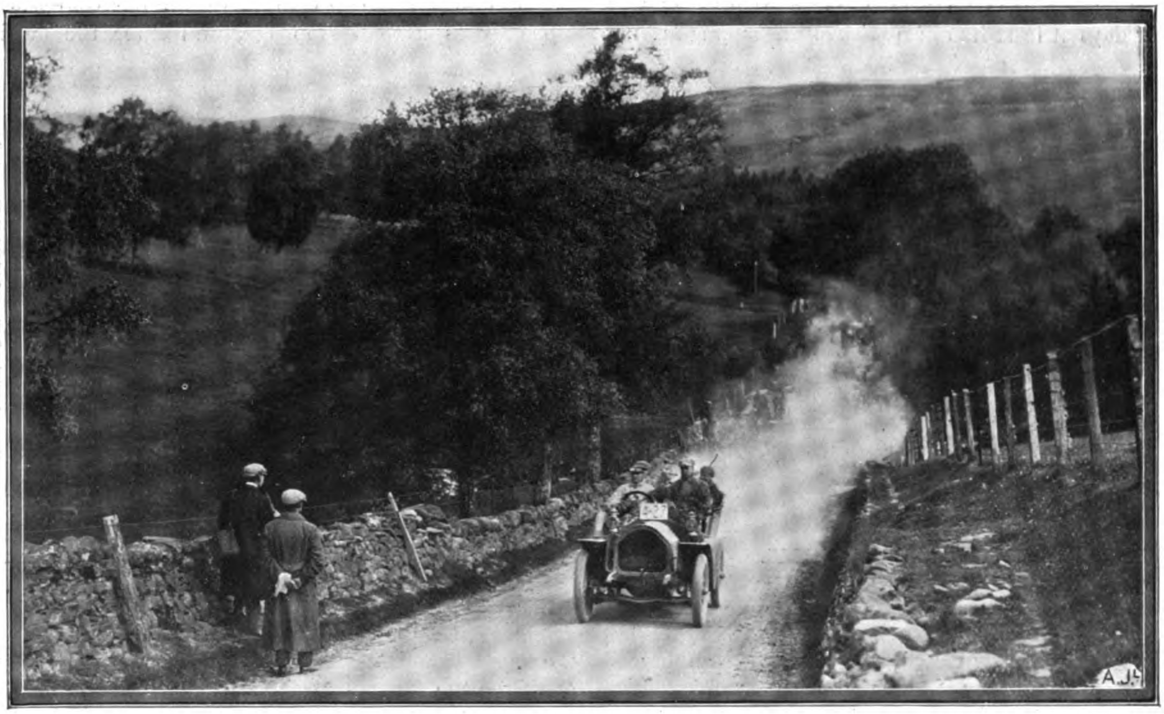
Car No. 5—47, 30-40-h.p. Martini.

"We have got to see this thing through together," was the greeting of Mr. E. G. Williams, whose Martini car had been doing battle for four cylinders against Mr. Claude Johnson's 6-cylinder Rolls-Royce ever since we left London in the prehistoric past.

Luck had been against the Martini from the start. It had well held its own on speed, on hill climb, on fuel consumption, but it was hundreds of points behind over some pesky little trouble which had really nothing to do with the question of four or forty cylinders. That was before reaching Glasgow on our trip north from London, since then, that is to say, since the beginning of the reliability run, things had been still amiss. Some trifle which an overhauling would disclose in a few seconds had made the motor what the Americans call "Mean as could be." It would go splendidly for a while, and then, for some unknown cause, it would get balky and refuse to throttle down on third speed. It was a nuisance, but Williams was a man of infinite patience, and when the engine was at its "balkiest" he would go ahead, steering with one hand and pumping the pressure-feed with the other, as though it was the most natural way in the world of driving a motor car.

All this I found out in the course of the day, the last of the trip, and by far the most enjoyable so far as exquisite scenery was concerned.

It was impossible not to feel a bit sorry for the summer visitors at Pitlochry, even though we envied them so much last night. It is such a delightful place that the longer one stays there the harder it must be to break away. And to think of leaving such a place by railway train, just as though it were Brixton or Putney, instead of leaving gradually by motor car and kissing goodbye to the glorious loch, the shaded road, the flowering shrubs and that architectural bijou, Blair Castle—the bare suggestion sounds sacreligious. Still, in spite of its ridiculous name, Killiecrankie will linger as a fond recollection of one of nature's most lovely spots in a land teeming with beauty.



SCOTTISH RELIABILITY TRIALS.—Fourth day. The hill climb on the final day at Trinafour. The 20-32-h.p. "Special Darracq" (No. 27), driven by Mr. Sydney Girling, makes a good start.

Our daily hill-climb comes soon after breakfast this morning. Except that it is fairly long—1,378 yards—there is nothing especially terrifying about it. The Martini takes it easily on second speed, and would probably have done it on third if that pesky little something in the motor's "innards" would only cease its troubling. But what a delightful morning's run this is. Who cares about time-keeping or minimum or maximum times on such a morning and through such scenery? We have run out of adjectives long ago, and the best we can do when we want to express our mutual admiration of a charming spot is a dialogue something after this fashion :—

WILLIAMS (shouting over his shoulder): "Isn't that fine?"
MYSELF (shouting back): "Great!"
(*Twenty minutes later.*)
MYSELF (shouting over Williams' shoulder): "Isn't that fine?"
WILLIAMS (shouting into space): "Great!"

Upon arriving at Inverary, where we stopped for luncheon, I compared notes with other unofficial observers, and found that the conversation in every car had dwindled to an inquiry, "Isn't that fine?" and a reply, "Great!" The young man on the Benz car, who looks like Prince Henry of Prussia, started to tell me what it sounded like in German, but our time was up before he got through half the first sentence, so I asked him to "tootle" the rest on his "tootle-tootler."

"Rest and be thankful." Doesn't it sound sublime and reposeful? But ask any man who has travelled the road, either uphill or downhill, and watch the look of horror in his face as he recalls its terrors. I do not know which is the worst, uphill or downhill. But I suppose it is like the country town where there were only two hotels; whichever you tried it would be found so bad that you would wish you had tried the other. But that awful climb downhill fairly nauseates me even yet at the recollection of its horrors. It was all the hill climbing we had done since leaving Glasgow rolled into one piece and reversed. At the top of the hill a stone, marked "Rest and be thankful," was supposed to supply the breathless climber with a ready-made pious ejaculation. But going down hill there is no carven stone, nor is it likely that the driver who had been finding "one more river to cross," or rather "one more precipice to drop over," for three miles or more before reaching the bottom would feel like saying "Be thankful" when he got there.

It is an ill wind, &c., as Mr. Williams discovered upon reaching "terra cotta" after the descent of "Rest and be—." By using his engine as a brake he got rid of whatever had been troubling it for the past three days, and from Arrochar to Glasgow the Martini worked like a charm.

"This is how it worked the day before we started from London, and again on the day before leaving Glasgow," said Mr. Williams. "Doesn't it seem the irony of fate that just as we are reaching home the car should pick up its good form and act better than it has done on the whole trip?"

It certainly was. But Reliability Trials are after all only chapters of accidents. The Martini got more than its share even on the last moment as we were reaching Glasgow; a crazy venturesome driver of a Darracq who had been trying to race everybody along the shores of Loch Lomond, gave his wheel a twist as the Martini was passing, and broke off a piece of the latter's mudguard.

But here we are back in Glasgow, covered in dust from head to foot, weary and stiff with our long ride, and glad it is over, yet ready for another next week if we had the chance. Writing about it is ten times more tedious, and I am heartily glad that my friend Mr. New is looking after data as to winners and withdrawals, &c., and all that I have to do is to wind up and subscribe my initials.

J. P. H.

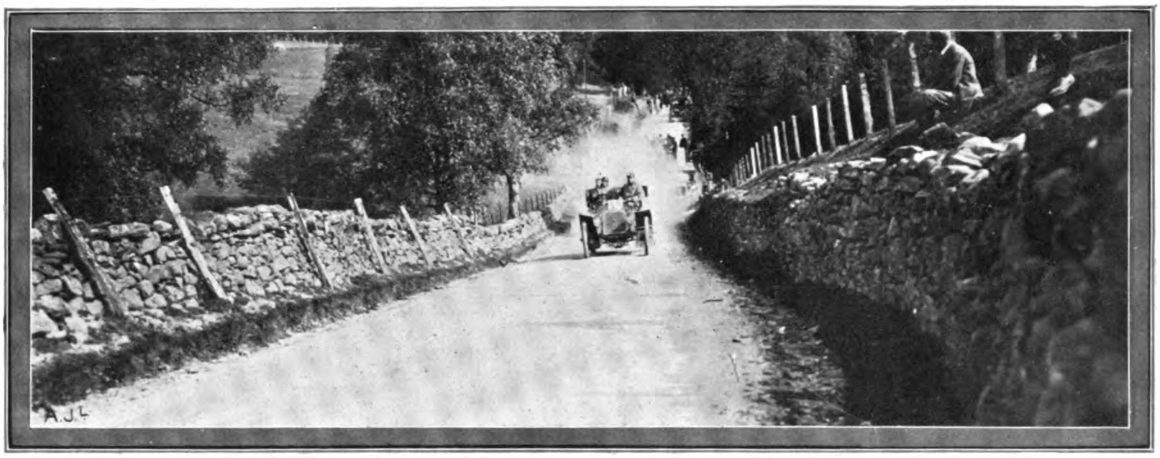
The Trial and what it has Accomplished.

Although the history of the trials and the daily happenings are told at length on other pages of the current issue, it is equally impossible here, as there, to refrain from mentioning the remarkable completeness of the arrangements that were made, and were carried out, by the Scottish Automobile Club (Western Section) on this occasion. No praise is, indeed, too high for the manner in which the various officials carried through their well-conceived, but very arduous task, or for the remarkably efficient energy of their ideal hon. sec., Mr. Robert J. Smith. Not only was the whole organisation of the trials themselves excellently conceived from start to finish, but it was evident, from the hearty welcome extended to the cavalcade all along the route, that the geniality, consideration, and diplomacy of Mr. R. J. Smith and his fellow workers had largely paved the way to success in advance. No motorist taking part in the trials—whether as driver, observer, mechanician, or passenger—could fail to appreciate the pleasant feeling that everyone he passed was a friend, and that for four days at least he ran no risk of unearthing lurking enemies, nor was even likely to see a scowling face. It is no easy matter to convey some three hundred odd people by road a distance of 671 miles over an inordinately formidable route, and to do so in four consecutive days to the entire satisfaction of the populace, as well as of the 300 persons more directly concerned. Add to this the further complication involved by keeping 79 cars—ranging from 6 to 40-h.p.—under continuous official observation, by holding a speed-contest each day up the most suitable hill on the route, and by keeping careful records of the exact weight carried and of the fuel consumed. That practically sums up what has been accomplished in the Scottish Reliability Trial of last week.

Before dealing with the actual results, or with any points concerning the competing cars, it might be as well to recall the more important conditions under which the trial was run, and to say a few words about the manner in which they were imposed. By so doing, a better idea will be obtained of the value of the figures that are available this week. Primarily, it will be remembered, each car was bound to carry its full complement of passengers *from* Glasgow *to* Glasgow without involuntary stop, and without repair or replacement of any kind whatever. Any shedding of passengers on any part of the route was consequently equivalent to disqualification—as far as being eligible for award was concerned—although as yet it has not been possible for the severely-taxed officials to prepare a complete list of the cars that violated this rule. It follows, therefore, that in this respect some modification may be anticipated in the final results. Tyre troubles were, however, excluded from ranking as penalty stops, provided that the total delay from this cause did not exceed one hour. For this reason, it will be found that full non-stop records are of two kinds—although they are equivalent to one another in the upshot—and that it is only fair to introduce a third type in the same category for one car which only incurred any loss of marks through spending more than an hour in attending to its tyres. Each penalised minute involved the deduction of one mark from the 800 marks set aside for "reliability."

Practically, it may be said that the average speed between the numerous controls was 19 miles per hour, although it was in some cases about 18 m.p.h. and in other sections it was nearer 20. Arriving before the minimum time was up automatically incurred the same penalty as a road stoppage, and since the maximum time allowance gave a wide margin, there was never any real excuse for fast travelling at any point. Naturally enough it was, nevertheless, customary for every car to reach each control at the earliest time permitted, and there was, moreover, much tiresome crawling at some part or another of every "open" section.

Fuel consumption per ton-mile throughout the trial, and best speed on the four test hills, each receive recognition in the scheme of marking under which the gold medal in each class is to be awarded. In its class, the most economical car, and the car which has made the best performance up the four hills, each receive 100 marks, and the other cars in the same class are awarded proportionately less points according to their deeds. It is consequently impossible at present to "spot the winners" of these most coveted medals until a vast amount of mathematical calculation has been completed, and it may well be that the "fuel" and the "hill" marks will put a very different complexion on the final results. For measuring the fuel, as much petrol was put into the tanks as they would hold before the cars left Glasgow, a careful note was taken of all replenishments during the trial, and finally the amount required to fill them up to the top was ascertained at the end of the last day. Every car and every occupant (with his baggage)



SCOTTISH RELIABILITY TRIALS.—The fourth day. The 20-24-h.p. Clement-Talbot (No. 71) taking the Trinafour Hill at good speed.

was officially weighed before starting in order that the observers' daily reports should accurately show the actual running weight of each vehicle. Except on the second day, everything worked very smoothly at the hill-climbs, and there was little or no delay at the foot of the hill. The cars were sent up singly in order to avoid inter-obstruction, telephone and flag communication enabling the officials at the various points to keep in close touch with one another.

There was virtually nothing to be gained by starting first or starting last, except that at certain points the later arrivals found the road looser at the corners, and that there was a greater risk of having to suit one's speed to that of other competitors; but the order of starting was very wisely changed each day to avoid the slightest suggestion of unfairness. On some of the narrower roads it was inevitable that a larger car should at times suffer from the presence of a less powerful competitor immediately in front of it, and this doubtless led to a higher fuel consumption as well as to abnormally high temperatures of many powerful engines. It was, however, but one of the many contributory causes that rendered the whole trial particularly severe for every class of vehicle, and consequently the motoring community in general will regard it as being anything but regrettable.

The test put upon the cars was of a crescendo nature, starting through the Lowlands and culminating in a route of a violently switchback character, complicated by sharp turns or S bends which fully equalled—even if they did not greatly exceed—the precipitous humps in number. From smooth, straight-forward running, where the man at the wheel had arms, legs, and eyes to spare, the time came when uninterrupted conversation was far from easy, and when he ceased even to realise that an alteration of posture would probably make the driving-seat more comfortable, until finally, on the last day's run, even the most accomplished driver on a "single-lever-control" car found himself longing for a few extra pairs of eyes, of feet, and of hands. The difficulties of steering, often to almost full-lock, while constantly having to "change speed," and almost simultaneously having to apply one or both brakes, is well enough in its way for a few miles, and is even fairly good fun now and again, but when this kind of thing becomes "chronic" it is apt to get monotonous or worse both for the driver and the mechanism beneath him. On a clear road, with no cars just in front and no cars following close up behind, the strain on driver and driven would satisfy the most ardent sportsman and the most ambitious engineer, but on this occasion, when each car formed one unit of a vast procession and had a hard-and-fast time-table to adhere to, it is little short of a marvel that only eleven cars (barely 14 per cent. of the starters) should have failed to complete the course, and that some twenty-four (say 30 per cent.) should have made clean non-stop records. At places, it would have been thought that serious accidents were inevitable, and yet the motor car of to-day proved itself to be so entirely reliable (in the widest sense of the word) that not a single one occurred.

SCOTTISH RELIABILITY TRIALS.—The third day. The steep descent to the Bridge of Brown, with its dangerous and difficult corners.

Our Tabulated Results.

Everything that is at present available in the way of official information concerning the performances of the 79 competing cars is given by us in the accompanying tables, and, in view of the foregoing remarks, our readers will have no difficulty in placing these non-final results at their true value. In Table I will be found a concise summary of the daily performances, together with the names of the drivers and the actual running weights of the cars without their passengers. Special attention should be directed to the last column, wherein the number of non-stop daily runs is given for each car, and brief references are made to the total losses of time, both for tyres and from other causes.

Table II is a partial *résumé* of Table I, but is restricted to those cars which had no delays of any kind, or which only suffered from tyre troubles. As already explained, the three vehicles in the second "non-stop" column are virtually on a par with the 21 cars which earned "absolute non-stops," since the total time occupied by them in tyre repair was less than 60 minutes. In the third

TABLE I.—SCOTTISH RELIABILITY TRIAL, 1906.

Table showing the Daily Performances of the Competing Cars, including their Actual Weights and the Names of the Drivers.

Official No.	Car and Driver.	Weight of Car Unloaded.			First Day.	Second Day.	Third Day.	Fourth Day.	Number of Non-Stop Daily Runs (with Summary of Minutes Lost).
	h.p.	cwt.	qrs.	lbs.					
						CLASS I (not exceeding £200).			
21	8 Rover (R. L. Jefferson)	12	2	0	N.S.	N.S.	N.S.	Driving stop (1m.)	3 (R – 1m.).
22	6 Rover (J. Gibbon, jun.)	10	0	17	N.S. (T – 5m.)	G. (14m.); *Withdrawn* (broken steering-rod)	— —	— —	1 (T – 5m., W)
25	9-10 Swift (R. H. Every)	14	1	14	N.S.	N.S. (T – 11, 14, and 10m.)	N.S. (T – 14m.)	Driving stop and tyres (1 & 7m.)	3 (2 T – 49, R – 8m.).
41	9-10 Adams-Hewitt (R. R. Smith)	—			Driving stop (1m.)	Carburettor (7m.)	n.s.	n.s.	2 (R – 8m.)
45	9-10 Cadillac (F. S. Bennett)	14	1	4	N.S. (T – 27m.)	N.S.	N.S.	N.S.	4 (1 T – 27m.).
65	8 Maxwell (F. W. Peckham)	11	2	8	N.S. (T – 16 and 23m.)	Commutator (3m.)	Driving stop and tyres (9 and 23m.)	Lubrication (1m.)	1 (T – 62, R – 13m.).
69	14 Pope-Tribune (W. R. Bell)	16	0	0	A (50m.)	Ignition (12m.); tyres (1h. 13m.)	Driving stops, &c. (14m.)	Driving stops, &c., (28m.)	0 (R – 80, T – 97m.).
						CLASS II (from £200 to £350).			
2	16 Albion (D. McNeil Sharp)	22	2	14	N.S.	N.S.	N.S.	N.S.	4.
4	12-15 Arrol-Johnston (E. A. Rosenheim)	21	3	0	N.S.	Clutch (4m.); tyres (24m.)	n.s.	Driving stops (2m.)	2 (R – 6, T – 24m.).
12	10-12 Humber (W. G. Tuck)	19	1	0	N.S.	N.S.	N.S.	N.S.	4.
14	10-12 Argyll (J. T. Maclachan)	19	3	7	N.S. (T – 20 and 23m.)	Driving stop (1m.)	n.s.	n.s.	3 (1 T – 43, R – 1m.).
28	10 Darracq (A. Brown)	16	2	0	N.S.	Ignition (5m.); driving stop (1m.)	n.s. (t – 10m.)	n.s.	3 (1 T – 10, R – 6m.).
40	16 Kelvin (W. M. Bergius)	16	2	21	N.S.	Stuck on hill (15m.)	n.s.	n.s.	3 (R – 15m.).
54	14-17 Scout (J. P. Dean)	18	2	0	N.S.	Driving stops (3 + 1m)	n.s.	*Withdrawn*	2 (R – 4m., W).
66	16 Maxwell (P. Cox)	16	2	14	N.S.	N.S.	N.S.	N.S.	4.
68	10 Alldays (E. R. Bell)	13	2	10	Driving stop (1m.)	Hill stops (3m.); tyres (5 + 20m.)	Driving stop (1m.)	Driving stop (1m.)	0 (R – 6, T – 75m.).
70	14 Vulcan (T. Rimmer)	20	3	21	N.S.	Commutator (4m.); tyres (15m.)	n.s.	n.s.	3 (R – 4, T – 15m).
75	12-14 Scottish Aster (J. McLean)	21	2	0	N.S.	Shed passengers (2m.)	Shed passenger (1m.)	Driving stop (1m.)	1 (R – 4m.).
77	12-14 Victoria (J. W. Penzer)	18	3	7	3 driving stops (5m.)	H (2h. 52m.)	K (33m.)	*Withdrawn*	0 (R – 210m., W).
80	16 Reo (H. G. Sharp)	16	3	8	N.S.	Delay starting (1m.)	Ignition (1m.)	n.s. (t – 32m.)	2 (1 T – 32, R – 2m.).
82	10 Argyll (Major J. W. Fraser)	16	0	14	B (10m.)	Driving stops (4m.)	n.s.	L (19m.)	1 (R – 33m.).
						CLASS III (from £350 to £500).			
5	12 Arrol-Johnston (C. Robertson)	21	3	7	C (4m.)	n.s.	n.s.	n.s. ? (M)	3 (?) (R – 4m.).
10	16-20 Humber (T. C. Pullinger)	23	2	0	Air lever (1m.)	n.s. (t – 16m.)	Petrol trouble (7m.)	n.s.	3 (1 T – 16, R – 8m.)
11	15 Darracq (H. Kennedy)	22	2	2	N.S.	N.S.	N.S.	N.S.	4.
13	16-20 Sunbeam (F. Eastmead)	23	0	10	N.S.	N.S.	N.S.	N.S.	4.
15	12-14 Argyll (W. M. Wallace)	21	2	14	Driving stop (1m.)	n.s.	n.s.	n.s.	3 (R – 1m.).
16	14-16 Argyll (J. Somerville)	21	3	10	N.S.	N.S.	Carburettor and Inlet-valve (45m.)	Driving stop (1m.)	2 (R – 46m.).
17	16-20 Argyll (W. T. R. Shirrefs-Gordon)	25	1	3	N.S.	N.S.	N.S.	N.S.	4.
18	15 Siddeley (A. E. Crowdy)	23	3	7	N.S.	N.S.	N.S.	N.S.	4.
19	14-22 Germain (H. Ramoisy)	20	3	0	N.S.	N.S.	N.S.	N.S.	4.
30	22 Minerva (E. Arnott)	23	0	7	Ignition (5m.)	Ignition plugs (6m.)	n.s. (t – 2m.)	n.s.	2 (1 T – 2, R – 11m.).
35	18-24 Courier (A. C. Gibbons)	23	3	10	N.S.	*Withdrawn*	— —	— —	1 (W).
37	15 De Dion (J. W. Stocks)	24	3	4	N.S.	N.S.	N.S.	N.S.	4.
42	14-20 Vinot (G. Usmar)	24	3	14	N.S.	N.S. (T – 24m.)	Petrol troubles (5m.)	Carburettor and shed passengers (2 and 1m.)	2 (1 T – 24, R – 8m.).
44	16-20 Chenard-W. (J. A. Peacock)	21	0	14	N.S.	Stops on hill (9m.); carburettor (2m.)	Shed passengers	Driving stop (6m.)	1 (R – 17, + ? m.).
49	18-22 Speedwell (M. L. Braithwaite)	22	1	0	N.S.	*Withdrawn*	— . —	— —	1 (W).
53	12-16 Wilson-Pilcher (G. H. F. Slaney)	24	1	6	N.S.	N.S.	N.S.	N.S.	4.
57	20-22 Mobile (L. Antweiler)	25	3	14	Water circulation (41m.)	n.s. (t – 23m.)	Driving stop (1m.)	n.s.	2 (1 T – 23, R – 42m.).
61	24 Mass (A. F. King)	25	2	9	N.S.	N.S. (T – 9m.)	Overturned but continued	n.s.	3 (1 T – 9, R – ? m.).
62	12-16 Talbot (H. Robinson)	19	3	7	D (14m.)	Delay start (21m.)	Carburettor (14m.)	Ignition (1m.)	0 (R – 50m.).

CLASS IV (from £500 to £650).

1	24 Albion (R. E. Wilson)	27	0	6	N.S.* (T – 1*hr.* 18m.)	N.S.* (T – 18m.)	N.S.*	N.S.*	4* (2T – 1h. 36m.).
3	18 Gladiator (C. Hamilton)	30	1	8	N.S.	N.S.	N.S.	N.S.	4.
6	18 Arrol-Johnston (E. J. C. Roberts)	18	3	14	E (153m.)	n.s. (t – 3m.)	n.s.	*Withdrawn* (sand in crank-chamber)	2 (1 T – 3, R – 153m., W).
7	24–30 Arrol-Johnston (W. S. Macharg)	27	3	0	N.S.	N.S.	N.S.	N.S.	4.
8	25 Siddeley (T. Shaw)	30	3	14	N.S.	N.S.	N.S.	N.S.	4.
9	24-32 Gladiator (A. McCormack)	30	3	0	N.S.	N.S.	N.S. (T – 3m.)	Caburettor (3m.), tyres (54m.)	3 (1 T – 57, R – 3m.).
20	20–30 Maudslay (B. Shiell)	27	0	21	Driving stop (1m.)	J. Disqualified?	Gear changing (1m.)	n.s.	1 (R – 2m., J ?).
23	20 Rolls-Royce (P. Northey)	19	1	0	N.S.	Petrol troubles (11m.)	n.s.	P. (44m.)	2 (R – 55m.).
27	20–32 Darracq (S. Girling)	26	1	12	N.S.	N.S.	N.S.	N.S.	4.
29	18–24 Peugeot (J. H. Paterson)	27	2	7	N.S.	N.S.	N.S.	N.S.	4.
32	25–30 Iris (A. C. Earp)	24	2	21	N.S.	N.S.	N.S.	N.S.	4.
34	20–30 Enfield (W. Oates)	25	1	4	F (37m.)	*Withdrawn* (broken water-connection)	— —	— —	0 (R – 37 + ? m., W).
36	28 Pipe (G. Dumont)	25	1	14	N.S.	N.S.	N.S.	N.S. (T – 2m.)	4 (1 T – 2m.).
38	30–36 Drummond (T. Smith)	27	1	24	N.S.	N.S.	Replacing bolts, and petrol (20 and 5m.)	Petrol refill (1m.)	2 (R – 26m.).
39	20–30 Pilain (Mrs. Loder)	27	2	0	N.S.	N.S.	N.S.	N.S.	4.
43	30–40 Chenard-W. (W. Gutmann)	28	2	0	Driving stops (2m.)	*Withdrawn* (broken axle)	— —	— —	0 (R – 2m., W).
46	25–30 Austin (S. G. Hands)	30	1	14	N.S.	N.S.	N.S.	Sheared key (80m.)	3 (R – 80m.).
48	24–30 St. Vincent (W. McLean)	28	2	24	N.S. (T – 15m.)	N.S.	Petrol refill (102m.)	n.s.	3 (1T – 15, R – 102m.).
50	28 Ariel-Simplex (P. Lewis)	32	2	0	Driving stop and tyre (1 and 16m.)	n.s.	n.s.	n.s.	3 (R – 1, T – 16m.).
58	25 Brooke (Mawdsley Brooke)	26	1	0	Ignition and tyres (2 and 15m.)	n.s. (t – 8m.)	*Withdrawn* (magneto broken)	— —	1 (1 T – 25, R – 2 + ?m., W).
64	30–40 Belsize (R. Crossley)	29	0	14	N.S.	N.S. (T – 16m.)	N.S.	N.S.	4 (1 T – 16m.).
71	20–24 Talbot (R. Laxen)	25	0	0	Ignition (6m.)	n.s.	n.s.	n.s.	3 (R – 6m.).
73	20–24 Horbick (— Cranham)	21	3	0	Ignition (70m.)	Ignition (22m.)	Repairs (15 and 26m.)	*Withdrawn*	0 (R – 133m., W).
76	30 Bell (W. Millington)	30	1	21	N.S.	N.S.	N.S.	N.S.	4.
79	28 Spyker (I. G. Raphael)	25	2	0	N.S.	N.S.	N.S.	N.S.	4.
83	25 Straker-Squire (S. Straker)	28	1	0	N.S.	New fan-belt (11m.)	n.s.	n.s.	3 (R – 11m.).
84	30 Standard (E. E. Leverett)	27	0	6	Dropped lamp (1m.)	n.s.	Water and petrol (2 and 1m.)	Ignition (1m.), water (4m.)	1 (R – 9m.).

CLASS V (exceeding £650).

24	30 Rolls-Royce (Claude Johnson)	26	3	0	N.S.	N.S.	N.S.	N.S.	4.
26	30 Daimler (Capt. F. V. Wentworth)	27	3	0	N.S. (T – 45 and 1m.)	N.S.	Pumps (2 and 2m.)	Pressure-valve (1m.)	2 (1 T – 46, R – 5 m.).
31	30–40 Peugeot (C. Friswell)	32	1	0	N.S.	*Withdrawn* (clutch troubles)	— —	— —	1 (W).
33	30–40 Humber (J. Reid)	28	3	21	N.S.	N.S.	Petrol trouble and tyres (8 and 23m).	n.s. ? (Q)	3 (?) (R – 8, T – 23m.).
47	30–40 Martini (E. G. Williams)	32	0	0	N.S.	Driving stops (2m.)	Clutch, and driving stop (1 and 1m.)	Adjusting chains (1m.)	1 (R – 5m.).
52	28–36 Armstrong-W. (W. G. Wilson)	29	2	0	N.S.	N.S.	N.S.	N.S.	4.
59	25–36 Brasier (M. R. Brown)	28	1	14	Igniters (4 and 3m.)	n.s.	n.s	n.s.	3 (R – 7m.).
60	35 Ariel-Simplex (C. Sangster)	34	2	0	Tightening pipe joint (1m.)	Water (1m.)	Driving stops (5m.)	Driving stop (1m.)	0 (R – 8m.).
63	24–34 Belsize (Mrs. Riley)	32	3	12	N.S.	*Withdrawn* (accumulators run down)	— —	— —	1 (W).
67	35 Ariel-Simplex (W. Cordery)	33	0	14	N.S.	Water (1m.); pressure valve (3m.)	Pressure-valve and tyres (3 and 32m.)	Clutch (3m.), driving stops (13m.)	1 (R – 23, T – 32m.).
74	30–35 Metallurgique (O. Cüpper)	26	2	0	N.S.	N.S.	Pressure on fuel-feed (1m.)	n.s.	3 (R – 1m.).
81	40 Benz (E. Stoecker)	29	2	7	N.S.	N.S.	Fan-belt (1m.)	n.s.	3 (R – 1m.).

Explanatory Notes to Reference Letters.

N.S. = Absolute non-stop and previous clean sheet.

N.S. (T – —m.) = Ditto, except for tyres.

n.s. = Absolute non-stops following stops on previous days.

n.s. (t – —m.) = Ditto, except for tyre troubles on day in question.

* Tyre troubles exceeded one hour, and consequently involve penalty for excess time.

A. Fan belt (1, 1 and 2m.), compression-cock (3m.), plugs (8m), carburettor (10m.), water (1m.) and tyre (24m.) = 50m.

B. Miss gear on hill (6m.), adjusting spring (3m.), engine stop (1m.) = 10m.

C. Water connection (1m.), driving stop (1m.) greaser (2m.), = 4m.

D. Gear changing (1m.), ignition (13m.) = 14m.

E. Fuel feed (2m.), exhaust valve (10 and 141m.) = 153m.

F. Petrol leak (8m.), carburettor and ignition (4, 20, 1 and 3), driving stop (1m.) = 37m.

G. Ignition (7m.), water (2m.), hill stops (2 and 3m.) = 14m.

H. Carburettor and ignition troubles, also driving stops, &c. = 2h. 52m.

J. Disqualification postponed, and car allowed to run pending adjudication on protest.

K. Repairing brake (5m.), engine (12m.), repairs (16m.) = 33m.

L. Jammed brake (5m.), ignition (5m.), gear changing (7 and 2m.) = 19m.

M. Undecided as to whether 17m. delay should be deemed a penalty stop or a traffic stop.

P. Petrol trouble (24m.), driving stop (9m.), changing ignition-plug (11m.) = 44m.

Q. Penalty stop *or* traffic stop (3m.)?

T = Tyre delays; R = "reliability" delays; W = withdrawal.

TABLE II.—SCOTTISH RELIABILITY TRIAL.

Results of the Four Hill-Climbs, the Competing Vehicles being arranged in their Order of Merit (according to speed) for each Hill.

Order of Merit.	Birkhill (1st Day). Length = 1,745 yards. Average gradient, 1 in 17.		Cairnwell (2nd Day). Length = 1,226 yards. Average gradient, 1 in 8·9.		Bridge-of-Avon (3rd Day). Length = 790 yards. Average gradient, 1·93.		Trinafour (4th Day). Length = 1,378 yards. Average gradient, 1 in 12·9.	
	Official Number.	Car.	Official Number.	Car.	Official Number.	Car.	Official Number.	Car.
CLASS I (not exceeding £200).								
		h.p.		h.p.		h.p.		h.p.
1st	25	9-10 Swift.	22	6 Rover.	25	9-10 Swift.	25	9-10 Swift.
2nd	21	8 Rover.	65	8 Maxwell.	65	8 Maxwell.	41	9-10 Adams-Hewitt.
3rd	41	9-10 Adams-Hewitt.	25	9-10 Swift.	21	8 Rover.	69	14 Pope-Tribune.
4th	45	9-10 Cadillac.	45	9-10 Cadillac.	45	9-10 Cadillac.	45	9-10 Cadillac.
5th	65	8 Maxwell.	41	9-10 Adams-Hewitt.	41	9-10 Adams-Hewitt.	65	8 Maxwell.
6th	22	6 Rover.	21	8 Rover.	69	14 Pope-Tribune.	21	8 Rover.
7th	69	14 Pope-Tribune.	69	14 Pope-Tribune.				
CLASS II (between £200 and £350).								
1st	70	14 Vulcan.	70	14 Vulcan.	82	10 Argyll.	70	14 Vulcan.
2nd	12	10-12 Coventry-Humber.	80	16 Reo.	70	14 Vulcan.	12	10-12 Coventry-Humber.
3rd	80	16 Reo.	82	10 Argyll.	12	10-12 Coventry-Humber.	4	12-15 Arrol-Johnston.
4th	68	10 Alldays.	4	12-15 Arrol-Johnston.	80	16 Reo.	68	10 Alldays.
5th	4	12-15 Arrol-Johnston.	28	10 Darracq.	54	14-17 Scout.	80	16 Reo.
6th	40	16 Kelvin.	66	16 Maxwell.	4	12-15 Arrol-Johnston.	28	10 Darracq.
7th	28	10 Darracq.	54	14-17 Scout.	68	10 Alldays.	40	16 Kelvin.
8th	54	14-17 Scout.	2	16 Albion.	28	10 Darracq.	82	10 Argyll.
9th	2	16 Albion.	68	10 Alldays.	40	16 Kelvin.	2	16 Albion.
10th	82	10 Argyll.	14	10-12 Argyll.	2	16 Albion.	54	14-17 Scout.
11th	66	16 Maxwell.	75	12-14 Scottish Aster.	14	10-12 Argyll.	66	16 Maxwell.
12th	75	12-14 Scottish Aster.	12	10-12 Coventry-Humber.	66	16 Maxwell.	75	12-14 Scottish Aster.
13th	77	12-14 Victoria.	40	16 Kelvin.	75	12-14 Scottish Aster.	14	10-12 Argyll.
14th	14	10-12 Argyll.	77	12-14 Victoria.				
CLASS III (between £350 and £500).								
1st	61	24 Mass.	61	24 Mass.	61	24 Mass.	10	16-20 Beeston-Humber.
2nd	30	22 Minerva.	19	14-22 Germain.	19	14-22 Germain.	61	24 Mass.
3rd	10	16-20 Beeston-Humber.	10	16-20 Beeston-Humber.	11	15 Darracq.	19	14-22 Germain.
4th	62	12-16 Clement-Talbot.	11	15 Darracq.	30	22 Minerva.	11	15 Darracq.
5th	19	14-22 Germain.	30	22 Minerva.	18	15 Siddeley.	30	22 Minerva.
6th	18	15 Siddeley.	18	15 Siddeley.	17	16-20 Argyll.	13	16-20 Sunbeam.
7th	17	16-20 Argyll.	17	16-20 Argyll.	57	20-22 Mobile.	53	12-16 Wilson-Pilcher.
8th	49	18-22 Speedwell.	53	12-16 Wilson-Pilcher.	53	12-16 Wilson-Pilcher.	18	15 Siddeley.
9th	57	20-22 Mobile.	62	12-16 Clement-Talbot.	13	16-20 Sunbeam.	57	20-22 Mobile.
10th	42	14-20 Vinot.	13	16-20 Sunbeam.	16	14-16 Argyll.	42	14-20 Vinot.
11th	35	18-24 Courier.	37	15 De Dion.	37	15 De Dion.	37	15 De Dion.
12th	13	16-20 Sunbeam.	57	20-22 Mobile.	42	14-20 Vinot.	16	14-16 Argyll.
13th	11	15 Darracq.	16	14-16 Argyll.	10	16-20 Beeston-Humber.	62	12-16 Clement-Talbot.
14th	53	12-16 Wilson-Pilcher.	42	14-20 Vinot.	15	12-14 Argyll.	17	16-20 Argyll.
15th	16	14-16 Argyll.	15	12-14 Argyll.	44	16-20 Chenard-Walcker.	44	16-20 Chenard-Walcker.
16th	44	16-20 Chenard-Walcker.	5	12 Arrol-Johnston.	5	12 Arrol-Johnston.	15	12-14 Argyll.
17th	37	15 De Dion.	44	16-20 Chenard-Walcker.	62	12-16 Clement-Talbot.	5	12 Arrol-Johnston.
18th	15	12-14 Argyll.						
19th	5	12 Arrol-Johnston.						
CLASS IV (between £500 and £650).								
1st	27	20-32 Special Darracq.	27	20-32 Special Darracq.	27	20-32 Special Darracq.	27	20-32 Special Darracq.
2nd	50	28 Ariel Simplex.	20	20-30 Maudslay.	50	28 Ariel-Simplex.	50	28 Ariel-Simplex.
3rd	20	20-30 Maudslay.	50	28 Ariel-Simplex.	20	20-30 Maudslay.	23	20 Rolls-Royce.
4th	64	30-40 Belsize.	32	25-30 Iris.	23	20 Rolls-Royce.	32	25-30 Iris.
5th	83	25 Straker-Squire.	36	28 Pipe.	83	25 Straker-Squire.	71	20-24 Clement-Talbot.
6th	32	25-30 Iris.	83	25 Straker-Squire.	64	30-40 Belsize.	83	25 Straker-Squire.
7th	23	20 Rolls-Royce.	64	30-40 Belsize.	36	28 Pipe.	46	25-30 Austin.
8th	46	25-30 Austin.	8	25 Siddeley.	46	25-30 Austin.	64	30-40 Belsize.
9th	71	20-24 Clement-Talbot.	46	25-30 Austin.	32	25-30 Iris.	29	18-24 Peugeot.
10th	43	30-40 Chenard-Walcker.	23	20 Rolls-Royce.	8	25 Siddeley.	1	24 Albion.
11th	79	28 Spyker.	38	30-36 Drummond.	71	20-24 Clement-Talbot.	20	20-30 Maudslay.
12th	3	18 Gladiator.	1	24 Albion.	76	30 Bell.	38	30-36 Drummond.
13th	8	25 Siddeley.	73	20-24 Horbick.	7	24-30 Arrol-Johnston.	7	24-30 Arrol-Johnston.
14th	84	30 Standard.	9	24-32 Gladiator.	84	30 Standard.	39	20-30 Pilain.
15th	73	20-24 Horbick.	29	18-24 Peugeot.	73	20-24 Horbick.	9	24-32 Gladiator.
16th	1	24 Albion.	84	30 Standard.	38	30-36 Drummond.	76	30 Bell.
17th	48	24-30 St. Vincent.	7	24-30 Arrol-Johnston.	9	24-32 Gladiator.	84	30 Standard.
18th	30	30-36 Drummond.	71	20-24 Clement-Talbot.	1	24 Albion.	36	28 Pipe.
19th	76	30 Bell.	76	30 Bell.	6	18 Arrol-Johnston.	73	20-24 Horbick.
20th	9	24-32 Gladiator.	3	18 Gladiator.	29	18-24 Peugeot.	3	18 Gladiator.
21st	39	20-30 Pilain.	6	18 Arrol-Johnston.	39	20-30 Pilain.	8	25 Siddeley.
22nd	58	25 Brooke.	39	20-30 Pilain.	3	18 Gladiator.	48	24-30 St. Vincent.
23rd	7	24-30 Arrol-Johnston.	79	28 Spyker.	79	28 Spyker.	79	28 Spyker.
24th	29	18-24 Peugeot.	48	24-30 St. Vincent.	41	24-30 St. Vincent.		
25th	36	28 Pipe.	43	30-40 Chenard-Walcker.				
26th	6	18 Arrol-Johnston.	58	25 Brooke.				
27th	34	20-30 Enfield.						

		Birkhill (1st Day).		Cairnwell (2nd Day).		Bridge-of-Avon (3rd Day).		Trinafour (4th Day).
		CLASS V. (exceeding £650).						
		h.p.		h.p.		h.p.		h.p.
1st	81	40 Benz.	26	30 Daimler.	26	30 Daimler.	26	30 Daimler.
2nd	26	30 Daimler.	60	35 Ariel-Simplex.	67	35 Ariel-Simplex.	33	30-40 Beeston-Humber.
3rd	60	35 Ariel-Simplex.	52	28-36 Armstrong-Whit.	60	35 Ariel-Simplex.	59	25-36 Brasier.
4th	33	30-40 Beeston-Humber.	33	30-40 Beeston-Humber.	52	28-36 Armstrong-Whit.	81	40 Benz.
5th	59	25-36 Brasier.	59	25-36 Brasier.	33	30-40 Beeston-Humber.	67	35 Ariel-Simplex.
6th	31	30-40 Peugeot.	67	35 Ariel-Simplex.	59	25-36 Brasier.	74	30-35 Metallurgique.
7th	52	28-36 Armstrong-Whit.	81	40 Benz.	81	40 Benz.	52	28-36 Armstrong-Whit.
8th	24	30 Rolls-Royce.	24	30 Rolls-Royce.	74	30-35 Metallurgique.	47	30-40 Martini.
9th	67	35 Ariel-Simplex.	47	30-40 Martini.	24	30 Rolls-Royce.	60	35 Ariel-Simplex.
10th	47	30-40 Martini.	74	30-35 Metallurgique.	47	30-40 Martini.	24	30 Rolls-Royce.
11th	63	24-34 Belsize.						
12th	74	30-35 Metallurgique.						

NOTE.—Certain cars mentioned in the above table may receive no marks for hill-climbing (nor be eligible for any awards) owing to their having shed some of their passengers. The results at present available are therefore only semi-official, and are not final.

column, the only occupant stands to lose 36 marks—purely because it exceeded the neutralised period, and took an additional 36 minutes in attending to its pneumatics.

Table III will doubtless be studied with very great interest, even though it may ultimately prove to be somewhat deceptive for the reasons that are given, and because it bears no direct indication as to the relative differences between the actual speeds of the various vehicles. It shows, however, the order of merit for each hill climb in each class.

Table III.—Non-stop Table, showing which vehicles made absolute non-stop runs throughout, and which cars only failed to do so on account of tyre troubles.

	Absolute Non-stop Records.		Non-stops daily, without penalisation for tyre troubles.		Non-stops daily, but penalised for tyre troubles exceeding one hour.
			CLASS 1.		
		1	h.p. 9-10 Cadillac (45)	0	
			CLASS 2.		
3	h.p. 16 Albion (2) 10-12 Cov. Humb. (12) 16 Maxwell (66)	0		0	
			CLASS 3.		
7	15 Darracq (11) 16-20 Sunbeam (13) 16-20 Argyll (17) 15 Siddeley (18) 14-22 Germain (19) 15 De Dion (37) 12 Wilson-Pilcher (53)	0		0	
			CLASS 4.		
9	18 Gladiator (3) 24-30 Arrol-Johnston (7) 25 Siddeley (8) 20-32 Darracq (27) 18-24 Peugeot (29) 25-30 Iris (32) 20-30 Pilain (39) 30 Bell (76) 28 Spyker (79)	2	28 Pipe (36) 30-40 Belsize (64)	1	h.p. 24 Albion (1)
			CLASS 5.		
2	30 Rolls-Royce (24) 28-36 Arms.-Whit. (52)	0		0	
21		3		1	

NOTE.—The total number of starters on the first day was 79, and the total number that completed the four-day trial was 68, only 11 cars, therefore, fell out.

Some Prominent Cars.

Among so many vehicles, it would obviously be impossible to refer either directly or indirectly to all those which richly deserve mention in view of their performances in the trial, or even to include in this report any details concerning the construction of those with which our readers are not already thoroughly acquainted. Fortunately the need for so doing is not great, owing to the comprehensive character of the accompanying tables of results, and of the special "construction" table which we gave on June 9th (pp. 704 and 705), for those tables taken in conjunction with one another tell as complete a story as could otherwise be condensed into many pages of print. Restricting ourselves more or less to those makes which figure amongst the "non-stops," or those with trivial delays, some comments will doubtless, however, prove of interest at this time.

Following for the most part an alphabetical order, the Albion cars come to mind first among the most successful, the smaller 16-h.p. model (2—2, meaning Class II, official No. 2) securing a clean sheet, while the 24-h.p. car (4—1) was the only car to be actually penalised for tyre troubles, and otherwise scored full non-stops. Hardly less successful, and certainly making a remarkably fine all round performance, were the Argyll vehicles, one of which—the 16-20-h.p. (3—17)—got its four non-stops, while two more—the 10-12-h.p. (2—14) and the 12-14-h.p. (3—15)—only failed to do so by one mark each. This particularly hard luck, so far as non-stop records go, was further emphasised by a refractory inlet-valve on the 14-16-h.p. model (3—16), which is one of the newest type turned out at the Alexandria Works, and has an Argyll-built engine. We occupied a seat on this neat little 4-cylinder vehicle during the run on the third day, and were most favourably impressed with its smooth and silent running.

Both the new 28-36-h.p. Armstrong-Whitworth car (5—52) and the same makers' well-known 12-16-h.p. Wilson-Pilcher vehicle (3—53) came through with flying colours, both figuring amongst the "absolute non-stops." The latest model was one of those to make its *début* on this occasion, and is a machine that possesses many extremely interesting and novel features. These include (1) an ingenious mechanism that not only renders it impossible to "run through" a gear when changing speed, but that also prevents the gear-lever from being moved before the clutch-pedal is depressed; (2) an automatic timing-gear—both for the high-tension battery ignition and for the low-tension magneto system—on the 4-cylinder vertical engine; (3) a very compact multiple-disc clutch which is quite independent of the fly-wheel; and (4) a hydraulic governor for regulating the speed of the engine. Mr.

W. G. Wilson has also so designed the engine and the gear-box that they form a single unit in the chassis, and are yet both easily accessible in case of internal troubles—one from beneath and the other from above.

Happening so near the conclusion of the trial—when, in fact, only a few more miles had to be covered—it was particularly hard lines that the Austin car (4—46) should have been delayed by a sheared key inside one of the sprockets on the countershaft. Up till then, no time of any kind had been lost and the car was evidently running splendidly. Although it was known that the single key in question was a weak point on this original "works" car, no other vehicle was available; at the time it gave way the car was carrying an abnormally heavy load, weighing in all, we hear, close on two tons. The Arrol-Johnston vehicles also had their full share of bad luck, although the latest model (4—7)—which has a 4-cylinder vertical engine—obtained a full non-stop record, and quite realised the expectations of Mr. J. S. Napier's many friends. The Dog-cart (3—5) plodded along manfully as usual, and the 12–15-h.p. model (2—4) appeared to be quite in its element on the very varied kinds of roads, but the great disappointment was the famous Tourist Trophy winner (4—6), which had nothing but ill-luck from start to finish; early on the first day a tramcar fractured several of the wire spokes in one of its driving-wheels, then an exhaust-valve broke, and finally sand in the crank-chamber reluctantly compelled Mr. E. J. C. Roberts to cease his plucky fight against the fates.

Four cars which show up exceedingly well—the first two gaining full marks for "reliability," and the last two only failing to do so by one mark each—are the 30-h.p. Bell (4—76), the 30–40-h.p. Belsize (4—64), the 40-h.p. Benz (5—81), and the 30–35-h.p. Metallurgique (5—74). It is true that the Belsize car lost a certain amount of time through tyre troubles, but the delay only amounted to 16 mins., and has, therefore, no effect on the marks gained. In Class I, the Cadillac (1—45) actually succeeded in coming through scathless, although naturally the small cars in this class had to bear the full brunt of the mountainous country. It was the only car in that class that did so, although the 8-h.p. Rover (1—21) ran it very close—only losing 1 min. on the last day—and a tyre on the Cadillac caused a delay of 27 mins. (non-penalised). The epicyclic gear, and the remarkable hill-climbing powers of the Cadillac, assisted it in no small measure, and on one occasion—when the Mass car was overturned—it even had to make a traffic stop on the steepest part of that awful hill, and was consequently called upon to restart from rest at that spot. A really wonderful performance, too, was that of the little British-built 9–10-h.p. Adams-Hewitt (1—41), which, but for a momentary delay on the first day, and a 7 min. stop on the second day, would have earned four "absolutes." Apparently a temporary obstruction in the jet of the carburettor was alone responsible for these trivial annoyances.

The all-British, 20–24-h.p, Clement-Talbot (4—71) came within an ace of having a clean record, and would indeed have secured its four non-stops but for a brief delay which was recorded against it for ignition-plugs on the first day. Similarly trifling troubles militated against the 30-h.p. Daimler (5—26), but it made amends by heading the list in three hill climbs out of four. On the hills in the next lower class, the "Special Darracq" (4—27) even went one better, and unless its fuel consumption proves to have been inordinately high, it looks like a sure winner of Class IV, for it also obtained a foremost place for "reliability" with the other "absolute non-stops." The 15-h.p. Darracq (3—11) followed suit by making non-stop runs each day, and it, too, figured well in the hill climbs.

Nobody was surprised that Mr. J. W. Stocks obtained an "absolute non-stop" for his 15-h.p. De Dion car (3–37), and, indeed, many would have been disappointed if he and it had not done so. Needless to say, the car ran grandly even though it was not as fast as several others on the hills. The 14–22-h.p. Germain (3–19) was also a very great favourite, and it not only kept a perfectly clean sheet in the hands of Mr. Ramoisy, but proved itself to be very fast on the hills. In the next higher class, both the Gladiators proved their undoubted good merits, the 18-h.p. (4–3) obtaining four non-stops, and Mr. McCormack's larger vehicle (4–9) only failing to do so in consequence of a 3-min. stop.

Humber cars, of which all three types were represented, made a very good showing, the 10–12-h.p. (3—12) getting a full score of non-stops, the 16–20-h.p. (3—10)—on which we spent one most successful day—only losing eight reliability marks, and coming forward splendidly on all the hills, and the new 6-cylinder 30–40-h.p. (5—33) proving itself to be a capital touring car. Another car of British design and build—the 25–30-h.p. Iris (4—32)—sailed through without the loss of a single mark, and still further bore out the expectations of Mr. Legros, who was travelling in the car, by securing a good place in each of the hill-climbs. Four foreign cars—the 16-h.p. Maxwell (2—66), the 18–24-h.p. Peugeot (4—29), the 20–30-h.p. Pilain (4—39), and the 28-h.p. Pipe (4—36), also ran through with full "reliability" marks.

Mr. Claude Johnson's already famous 6-cylinder Rolls-Royce (5—24) ran as magnificently as usual, its smooth running and its remarkable silence evidently making a deep impression on the inhabitants all along the route, as we had an excellent opportunity of observing as we glided along through town after town on the first day of the trials. The 20-h.p. "T.T." "R.R." (4—23) was still undergoing its tuning-up process in readiness for September's race, and, taking this very important fact into account, it "did none so badly." Considering that it is already geared extremely high in readiness for the Isle of Man course, its hill-climbing powers came as a surprise to many motorists, and it was evident that even in racing trim it is a most useful type of vehicle. Both the Siddeley cars—the 15-h.p. (3—18) and the 25-h.p. (4—8)—romped through without an involuntary stop of any description, as also did the 28-h.p. Spyker.

A new make of car which created a most favourable impression was the 25-h.p. Straker-Squire (4—83), which, but for the extra caution of Mr. Sidney Straker in fitting a new belt to the fan, would probably have come through the entire trial scathless instead of having a few minutes chalked up against it. It is a most interesting and thoroughly sound vehicle, and was one of those on which we made a day's journey as a passenger. Consideration of space prevents us, however, from giving full particulars at present, and we must, consequently, content ourselves with saying that its engine has variable lift inlet-valves, which, together with the exhaust-valve-gear and the low-tension ignition devices, are completely closed in, and that the change-speed-gear is so arranged that the gear-wheels ride quite idly upon their shafts until slid partly into mesh with one another—jaw-clutches taking the shock usually imposed on the teeth.

The "Sunbeam" car (3—13) was the remaining com-

SCOTTISH RELIABILITY TRIALS.—Fourth day. The competing cars on the last day of the run, assembled at Inverary during luncheon time.

plete non-stop maker, this distinctive-looking vehicle, with its encased side-chains, appearing, whenever we happened to pass it or be passed by it, to take everything as a matter of course as it came along.

Amongst those who suffered particularly hard luck it is only fair to mention, in particular, two more British-built cars. We refer to the 6-cylinder Brooke (4—58) and to the 6-cylinder Standard (4—84), both of which were going along swimmingly until an important portion of the magneto gave way on the former, and until, at one of the garages, an all too willing "pusher" heaved with his shoulder against the top of the radiator (!) while the brakes were "on," and proved powerful enough to spring a serious leak all along the lower tube-plate.

Tyres.

Taking them all round, the tyres on the various cars behaved admirably, large numbers of the competitors being delighted with their Dunlops, and others—particularly those who used the new non-skid pattern—being most enthusiastic about their Continental tyres. The remarkable enterprise of both manufacturers was again well to the fore; the "Continental" banners and temporary depôts were, indeed, quite a feature at frequent intervals all along the route.

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The Inconsistencies of Motor Car Law.

MR. FRANCIS, at the South Western Police Court recently, expressed himself tersely and to the point on the absurdity of the Motor Car Act which compels endorsement of licences, no matter how trifling the offence may be. As the learned magistrate observed, when a man is knocked down and killed the driver need not have his licence endorsed, but if he was driving one mile per hour over the speed limit, and he was only fined say 1*s*., the magistrate was compelled to endorse the licence. "Such," he concluded, "was the inconsistency of the motor car laws."

Dust Discussion in Derbyshire.

IT is pleasing to note how much ability secretaries of provincial clubs at times display in replying to the prejudiced observations which but too frequently appear in local newspapers. The Derby *Daily Telegraph* recently distinguished itself by a very virulent article on the dust question, in which it threw the whole blame for the nuisance, which undoubtedly exists, on automobilists, and suggested that the behaviour of motorists in raising dust was quite illegal. This was very trenchantly replied to by Mr. C. J. Allin, the hon. secretary of the Derby Automobile Club, though it is a noticeable fact that his reply did not appear till some time after it had been sent in. We quote from Mr. Allin's letter the following pithy observations :—

> "Without a doubt the dust (caused by the hoofs of horses and iron-tyred vehicles of all descriptions) is an unmitigated nuisance when raised by passing motor cars, but while the roads of Derbyshire are 'repaired' by rolling in the fresh metal with the previous sweepings of the surface, and even (as I have seen within five miles of Derby) with soil taken from the adjoining fields, there is bound to be dust in dry weather, and corresponding mud in wet weather. Whether this new and world-wide form of locomotion is to be suppressed in its vigorous infancy because of antiquated methods of road manufacture and repair, or whether our highways, under some central and competent authority, are to be made suitable for the new condition of things, time will show; the question is too vast and important to even touch upon in such a letter as this. There is, however, a very grave reflection upon motorists as a body in your leading article which calls for a forcible and unhesitating protest, and that is, that in raising this dust which they do not make, but which is already on the highway, motorists are guilty of illegal and iniquitous behaviour; the assertion that the police, by winking at the matter, practically aid and abet those whom you thus dub law-breakers, may be safely left to the notice of the Chief Constable of the county.

THE IRISH RELIABILITY TRIALS.

IRISH RELIABILITY TRIAL.—The cars returning to Dublin on the second day from Dundalk. Crossing O'Connell Bridge. The front car is No. 23, Clement-Talbot.

During the latter part of last week—and for some unknown reason on the very days selected for the Scottish Reliability Trials—the Irish Automobile Club held their Reliability Trials open both to members of the club and to the trade. A car owned by a member of the club could, under the rules, be entered in both sections, and thus become eligible for further awards. Of the 38 entries 28 turned up at the start, which took place at the club premises in Dawson Street, Dublin, on Wednesday, June 13th. The first day's run was to Carlow and back, the distance being about fifty miles each way. On the outward journey only two of the cars had stops for any cause whatever, and these were of quite a minor character. Mr. Heaven was unfortunate in stopping the engine of his Cadillac when letting in his clutch after descending a hill, while Mr. P. Hallinan lost thirty minutes through a short circuit in the ignition system of his Clement. The return journey was resumed in the order in which the cars arrived in Carlow, and the majority reached the headquarters well within schedule time, Mr. Harvey Du Cros, Jun., on one of the new 25–30-h.p. Austin cars, leading the van.

Another 100-mile run took place on the Thursday, when the cars were sent off to Dundalk and back. On the whole there was little excitement, and this, as well as the first day's run, passed off without any incident of note. Cars were dispatched at three-minute intervals, and all, with the exception of Mr. P. Hallinan's Clement, which failed to start at the first turn of the handle, were successful in getting away immediately the word "Go!" was given. The coast road was followed and the routes, which were on the whole very bad, proved on this occasion even less pleasant than usual, on account of the enormous clouds of dust. The severest test during this day's run was the ascent of Tullyesker Hill, but it was easily surmounted by all the cars, many of them being able to ascend on their top gears. At Dundalk the cars were garaged in the Marquis of Roden's grounds, during the interval preceding the return journey. A few of the cars suffered from tyre troubles, and among them was Mr. Heaven's Cadillac, which had been unfortunate on the previous day. A similar stop was reported by the "All Irish" Chambers car, which has been attracting considerable attention in these trials. In spite of these delays, however, all the vehicles managed to get back to Dublin within the time limit.

Friday was the last day of the actual touring part of the competition, the cars having to travel to Gorey and back. This was undoubtedly the hardest of the three runs, and proved to be somewhat disastrous to the non-stop records of some of the competitors, although only one, Mr. Godwin Swifte's 16–24-h.p. Prosper-Lambert, was placed *hors de combat.* Near Inche, this car came to grief by a breakdown of the differential gear, and it had to be abandoned on the roadside, whilst the owner came back by train. The little Chambers car again ran splendidly, and Miss Wheeler, the only lady competitor, again drove her Rover with success. Rain fell steadily for the first half of the day, and the persistent drizzle obliterated the glorious scenery, which would have otherwise been such a pleasant feature of the run. It also had the effect of converting a thick coating of dust into a layer of mud, and this in itself was sufficient to impair the chances of the competitors reaching home without trouble, although the route lay over some of the best roads.

A curious incident happened at the start of this run, for, just as Mr. T. Plunkett was being sent off, a dog suddenly jumped up beside him, and startled him into doing something which caused the engine of his Clement car to stop. Of all the bits of ill luck this was perhaps the one most regretted by other competitors, for it was generally acknowledged that Mr. Plunkett had behaved in a very sportsmanlike manner, in, as holder, allowing the Goff Challenge Cup, which he won at the Portmarnock Speed Trials, to be competed for in a reliability trial of this nature.

Following the three days' Reliability Trials, a hill-climbing competition took place on Callow Hill, co. Wicklow, a very steep ascent, situated on the road from Newtownmountkennedy to Roundwood. Thirty cars competed, five of which were additional entries to those which had taken part in the previous section of the

Results of Irish Reliability Trials.

Official Number.	Car and Entrant.	Non-Stops.	Hill-Climb.
	SECTION I (AMATEURS).		
	Class A.		
	h.p.		m. s.
17	*6 Rover (T. W. Murphy)	N.S.	7 44$\frac{1}{5}$
	Class B.		
3	10 Cadillac (W. A. R. Heaven)	—	7 50$\frac{1}{5}$
13	8-10 Rover (Miss E. M. Wheeler)	—	9 36$\frac{2}{5}$
	Class C.		
18	12 Orleans (Col. R. Chaloner Knox) ...	N.S.	3 47$\frac{3}{5}$
31	10-12 Clement (P. Hallinan)	—	5 28$\frac{1}{5}$
21	10-12 Humber (J. B. Dunlop)	—	4 0$\frac{3}{5}$
	Class D.		
2	*16-20 Beeston-Humber (G. M. Meares) ...	N.S.	3 3$\frac{2}{5}$
8	20-32 Darracq (E. C. Herdman)	—	3 13$\frac{1}{5}$
	*16-24 Prosper-Lambert (Godwin Swifte) ...	—	
19	*14-16 Argyll (W. D. Sainsbury)	N.S.	3 57$\frac{1}{5}$
	Class E.		
4	28 Daimler (Thomas Henshaw)	N.S.	2 24
12	28 Daimler (T. L. Plunkett)	—	
15	22 Orleans (Capt. Lindsay Knox)	N.S.	3 58$\frac{4}{5}$
	Class F.		
14	40 Ariel-Simplex (R. W. Morris)	—	3 12$\frac{2}{5}$
34	30 Napier (H. Whitworth)	—	
35	*20 Clement (Sir W. G. D. Goff)	—	4 24$\frac{3}{5}$
	SECTION II (OPEN).		
	Class A.		
25	8 Chambers (Chambers Company)	N.S.	5 52$\frac{3}{5}$
	Class B.		
28	12-14 Globe (D. M. Turner)	—	6 54$\frac{2}{5}$
27	8 Clement-Talbot (J. E. Mills)	N.S.	4 11$\frac{3}{5}$
	Class C.		
7	10-12 Argyll (Argylls, Ltd.)	—	5 40
	Class D.		
6	12-14 Argyll (Argylls, Limited)	N.S.	4 1$\frac{1}{5}$
11	16-20 Beeston-Humber (Thomas C. Pullinger)	N.S.	3 12$\frac{1}{5}$
23	22 Minerva (J. T. C. Moore Brabazon) ...	N.S.	2 21$\frac{4}{5}$
35	15-20 Unic (E. M. Stirling)	—	5 45$\frac{2}{5}$
26	14-18 Vinot (T. J. Watters)	—	4 33$\frac{1}{5}$
30	20 Gladiator (W. F. Pearse)	N.S.	3 17$\frac{2}{5}$
	Class E.		
5	25-30 Austin (H. Du Cros, junr.)	N.S.	2 43$\frac{2}{5}$
23	20-24 Clement-Talbot (S. T. Robinson) ...	N.S.	2 43$\frac{2}{5}$
	Class F.—Extra Class for Hill-Climb Only.		
—	Argyll (W. R. McTaggart)	—	2 43$\frac{2}{5}$
—	16-20 Winton (Turner Bros.)	—	6 23$\frac{2}{5}$
—	10-12 Rover (Mrs. R. J. Mecredy)	—	4 42$\frac{1}{5}$
—	20 Argyll (Sir H. Robinson)	—	3 23$\frac{2}{5}$
—	10-12 Clement-Talbot (Col. Thomas)... ...	—	5 55$\frac{4}{5}$

* Entered in Open Section also.

trial. On the other hand there were two competitors who had been successful in coming through the three days' trial, but who abandoned the contest on Friday night. These were Mr. Plunkett and Mr. Whitworth, their reason for giving up being that they did not consider that their chances of winning an award sufficiently bright on account of the delays which they had already experienced. The cars were sent off from a standing start, and almost at once had to face the steepest portion of the hill, which made the competition almost as much a test of skill in driving as it was of the actual climbing powers of the cars.

In our accompanying table we give the time made by each competitor up the hill in order that they may be compared one with another; but the times are no indication of speed, as the exact distance is not made public. In the same table also note is made of those cars which completed the trial without involuntary stops; but this list does not signify that such vehicles have necessarily obtained full marks, for some of them may have lost points on account of minor infringements of the rules. It should be noted that, although no marks are to be allotted in connection with the run out to the site of the hill climb on Saturday, yet any involuntary stops *en route*, or even while making preliminary ascents up the hill, were counted against the cars.

Subject to a final audit it has been announced that Mr. J. B. Dunlop has won the Goff Challenge Cup, with his 10-12-h.p. Humber car. Mr. T. Henshaw (28-h.p. Daimler), and Col. Chaloner Knox (12-h.p. Orleans), are second and third respectively in the amateur section. Mr. Harvey Du Cros, jun., secures the 200 Guinea Dunlop Cup with the new 30-35-h.p. Austin car, and Mr. S. T. Robinson, with a 20-24-h.p. Clement-Talbot, takes the 100 Guinea Dunlop Cup as second prize. Particulars of the rules governing the awards were summarised in THE AUTOMOTOR JOURNAL of May 12th. It will be remembered that the marks are allotted for reliability, economy and hill-climbing, the latter being a handicap event based on a somewhat complicated formula, involving the estimation of the time taken by a "bogey" car to climb the hill. There was only a difference of 0·47 in the marks obtained by the first and second competitors, but Mr. J. B. Dunlop, and in no less degree the Humber Company, are to be congratulated on winning, for the car was only delivered to its owner just before the trials commenced. Technically, Mr. Dunlop actually had one stop *en route*, but it was only due to taking a wrong turning.

* * * *

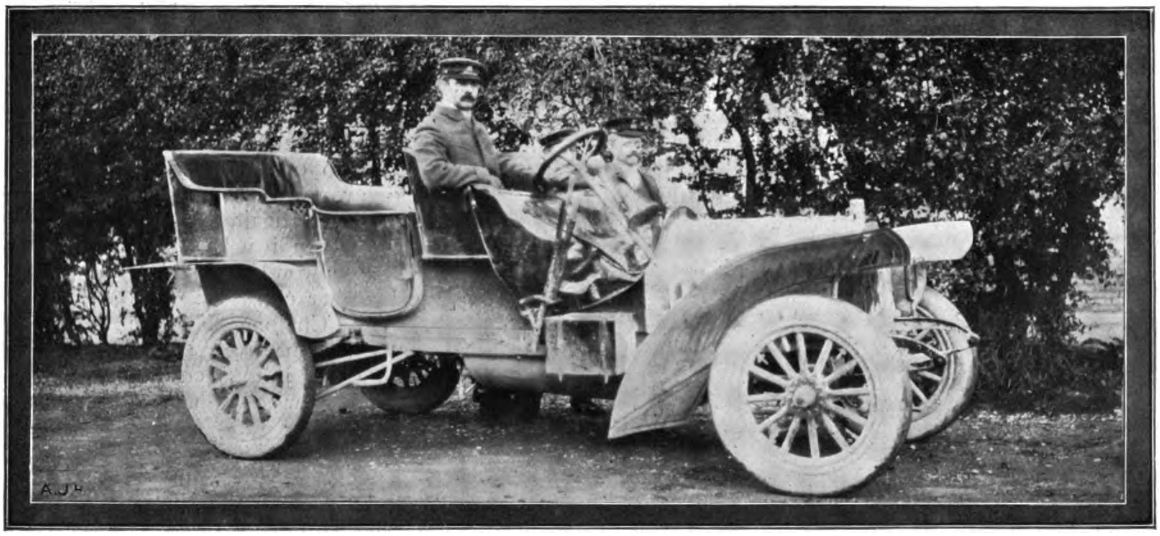
Napier Cars for the 1907 Herkomer Trophy.

MR. S. F. EDGE, we learn, intends to enter some 6-cylinder Napier cars in next year's contest, in order to swell the chances of scoring a success for Great Britain.

The Danger of Reflection.

THE glass wind screen certainly seems to have been proved to be a very serious source of danger when driving at night, in the proceedings which came before Sir Albert de Rutzen at Bow Street recently. Dr. Lankaster, of Upper Wimpole Street, was driving up the Mall in a hansom cab, across the new Queen's Gardens, facing Buckingham Palace, when it was struck in a most unaccountable manner by a motor car driven by Mr. Walter Demuth, of Westminster Palace Gardens. The cab was seriously damaged, and would have fallen but that it became wedged on the bonnet of the car. Mr. Demuth, who was charged with driving to the danger of the public, and ultimately fined £5 and £3 costs, explained that the reflection from the inner side of the glass wind shield, caused by the arc lamps he was passing, so dazzled him that he simply could not see where he was going. It was undoubtedly a very bad piece of luck for Mr. Demuth, but that his misfortune will be a benefit to the public by drawing attention to a possible danger, which every motorist who uses a glass wind shield is likely to encounter when driving through a well-lighted town at night, we are loth to believe, for it is surely only very exceptionally that the reflection is so serious as to cause absolute danger.

THE HERKOMER TROPHY.



HERKOMER TROPHY.—Dr. Rudolf Stoss-Zwickau on his 18-20-h.p. Horch Car, the winner of the Herkomer Trophy this year.

From the standpoint of one who has been through every stage of the Herkomer contest, the matter resolves itself under several headings, some of them to be pondered, but the bulk mere reflections of an entirely pleasant sort. The earlier stages to Vienna, which were dealt with last week, were nothing like as interesting as the remaining half of the runs. One special incident which still remains silhouetted among the rest, is the figure of the frail and aged Emperor of Austria at the Vienna Exhibition. Francis Joseph, who, no less than Prince Henry of Prussia, takes a keen interest in modern road locomotion, and His Imperial Majesty made a very careful inspection of the cars, being interested in the Daimler driven by Mr. Birtwistle, and commenting especially on the fact that the British team was practically the only example in which every car was equipped with coachwork worthy of a privately-owned touring car. The barefaced manner in which this section of the regulations has been flouted is one of the most regrettable parts of a competition initiated by a distinguished artist, whose whole and sole aim is to encourage the production of the most desirable and eminently legitimate design of horseless carriage for private use.

As the competition is designed wholly for private owners as against professional motormen, a committee should have laid down the rule that, though no marks could be gained by bodywork, yet by whatever degree the carrosse failed of being handsome and comfortable it should be docked in marks. The adoption of a policy like this would entirely have frustrated the undesirable action of such entrants as the owner of the 90-h.p. Mercedes racing car which, by mistake of one of the officials, was allowed to run, and has actually been awarded seventh place in the competition though it has only a rod of bent metal for the step to the front seats, the tonneau is a caricature of the real thing, and the whole turn-out had merely a wash of grey paint. Several other equally flagrant examples might easily be cited, but one will suffice.

When the road was resumed from Vienna early on Sunday morning for a 60 mile stage to the little village of Schottwein for the timed hill-climb up the Semmering, it was noticed that the number of starters had been thinned down by approximately 25 per cent. In striking contrast with the scene on the Kesselberg last year was the comparative sparsity of knickerbockered spectators on the Semmering, for car, cab, and cycle are the only means of getting to and from the spot within reasonable time. The road was not particularly well-kept, though signalmen with blue flags were stationed at the various bends save only the first. Of course, this accordingly became the scene of some very interesting wrecks, happily without the least injury to life.

There was no occasion for courting risks, because every half minute saved in time above the allowance made by the committee's formula merely represented one mark in a driver's favour, and as there were only eight corners to be negotiated, and the machines had two and two-thirds days' running to go through after the event in order to continue in the competition for the Trophy, it was not worth risking burst tyres and other trouble by overstraining at the corners. The first of the Britishers to make the ascent was Mr. Willie Rendle at the wheel of his father's car. His performance was without question the most dashing and adroit of any during the day. He took his corners beautifully, and lost a minimum of time in accelerating. One's only regret is that none of the times made up the Semmering that day will ever be published. Mr. Stotesbury was the second of the "Phalanx of Forty-Fives" to come up, but it was plain that his tactics were to take the climb cautiously and keep his car in rather than show off her paces, a policy which was likewise adopted by Mr. W. Herdman Ash, who may be described as the *doyen* of the competition, and whose fine sportsmanship in entering and going through a severe trial with a car at his age was one of the most admired features in connection with the British contingent.

As we walked down the hill we had unwelcome news, for it appeared that the brightest chance of the British team had gone, owing to the 45-h.p. cars of Mr. Arthur Birtwistle and of the Cavalier Gino de Martino having run into the bank in negotiating the first curve. Happily, no one was in the least hurt or even shaken, while the only part of the machines injured were the axles. Mr. Percy Martin immediately resolved to set about getting the two damaged machines on the road again in order that they might complete the course like any of the others. With only the resources of a village which is asleep half the year, this proved no easy job on a Sunday, but the whole subsequent story of these two cars is one of the finest examples of British sportsmanship that have been afforded to motorists on the Continent. Mrs. Manville made a fine run on the 35-h.p. car which she drove last year, and Mr. A. D. Grigg all but caught her up, owing to her being baulked for a space as she approached the last bend—a hindrance for which the committee courteously allowed her one mark. Prince Henry, on his Benz, drove with goggles and had a half-smoked cigarette in his mouth. He also followed the common practice (save with the Britishers) in having one-half of his bonnet open. It was a comical sight to go back to the village and see the smaller touring cars cannonading away for minutes before the time for them to start on the half-mile run to the timekeeper's box for a flying start. Conspicuous among the lower-powered machines, however, was the quiet little Argyll, which went up the hills slowly but surely, with Mr. Robertson Grant at the wheel.

Though we had arrived at Schottwein from seven o'clock in the morning onwards, it was Monday before it was possible to get at the two damaged cars. By dint of dogged perseverance, and with the aid of an exceedingly intelligent village blacksmith, both machines were got going by twenty minutes past five on the Monday morning, though this was only achieved by not ceasing from the work for a moment even to refresh the inner-man. Though the majority of us had only experienced from two to three hours' sleep since the Saturday morning, it was resolved to continue the chase over the route mapped out, and the amazement of the Germans may be better imagined than described when they found at Munich that not only had Mrs. Edward Manville (on the only car of the 156 entries that was run in last year's race) finished the tour first of all competitors, but that the two cars which had been left on the Semmering in what had appeared to them to be a hopelessly broken condition, had actually completed the course within four hours of the finish of those that had been enabled to run through without mishaps.

Roads in the Austrian Tyrol were in very good condition, and the people are exceedingly friendly to motorists, it being our lot to have bouquets of beautiful mountain flowers cast into the cars about every mile throughout our progress. The coolness of the air, the clearness of the sky, the babble of mountain streams, and the patches of snow on the high places, were in turn succeeded by a descent on to a valley road whence rocks rose up beside us, and sleeping drivers were frequently encountered at the most critical parts. Further on, after leaving Semmering, we had another panorama of blue mountain tops against a background of bulky black rain clouds, the peaks in the foreground being wrapped in white mists and drifting vapours. In a word, we were in a country where one needs a powerful car to properly enjoy the scenery without the spectacle proving tedious, as is the case when travelling by horse-drawn vehicles, and, in lesser degree with small-powered motor cars.

Sunday night was spent at Klagenfurt, whence we set

HERKOMER TROPHY.—A panoramic view of the Semmering Hill, which was one of the difficult driving tests included in the long distance trial for the Herkomer Trophy.

forth the following morning for the run alongside rivers and mountains to Innsbrück. At the conclusion of the tour it was generally agreed that this was the most beautiful stretch of touring of any mapped out, the prospects being so vast and the roads of such an ever winding nature that new views were constantly being unfolded. The hill-climb of the day, up the famous Brenner Pass, was not timed, which perhaps was just as well for some of the competitors who prided themselves on their reserve engine power.

The final run was the critical one of the series by reason of the bad ascent up the Seeleberg from Zirl to Seefeld, a few kilometres after leaving Innsbrück. It was characteristic of Prince Henry of Prussia (who occupied the waits in control alternately by assisting his mechanician in attending to the car and in praising that ex-naval stoker of his own flagship), that he went to several fellow competitors and told them where they should change gear even as he had done in the case of the Semmering climb. The rise to Seefeld has been likened to going up the side of a house for a mile and a half, the gradient over that distance averaging 1 in 4, it being 1 in 3 at a very critical hairpin corner where many of the cars got stuck. The Prince and the Britishers were among those who came through with flying colours and went on towards the frontier, leaving Austria and pursuing the beautiful road through the Mittenwald to Munich, on approaching which city the machines were held up at the Forstenrieder Park for the speed trials. The road was unfortunately found to be in a much worse condition than last year owing to heavy rains.

It might well be thought that a three mile race on a level would be nothing very dramatic as the finish of the second international competition for the Herkomer Trophy; but the event proved otherwise for when the small cars came to be run down the course, it was found that if the racing 90-h.p. was to win against the 18-h.p. Horch on the handicap the former would have to travel at a speed of approximately 200 miles an hour! As for the legitimate touring cars, such as the 45-h.p. Daimlers, the handicap expected them to run at about 160 to 170 miles an hour each!

Truth to tell the officials of the club were more dismayed at the appalling discovery that the competition had been rendered a fiasco, than the competitors themselves. How such a situation occurred no one quite seems to know, because from the facts available in the way of previously published data the impression had got abroad that the handicap was appreciably in favour of the high-powered car, as the committee intended it should be. It has since appeared, however, that in place of drawing up the curve for the speed formula by actually taking cars of various types over the course, the work had been entrusted to a professor of mathematics. In the circumstances, comparatively little interest attaches to the results achieved in the tests and it will therefore suffice to record that on the handicap the three best performances in the Forstenrieder Park were made by Dr. Rudolf Stoss's 18-h.p. Horch, by Herr Carl Westphal's 16-h.p. Germain, and by Herr Georg Betzin's 18-h.p. Horch.

The facts that the two speed trials practically determined the issue of the whole competition and that the formula was so farcical in its effect, make it rather surprising that any of the big British cars should be placed at all. As it was, Mr. A. D. Grigg made such a magnificent performance with his 45-h.p. Daimler on the Semmering, that having come within a fifth of a second of Mrs. Manville on the level, he won 11th place and a very handsome plaque. Mrs. Edward Manville, on her last year's "35," has had an exceedingly handsome special prize awarded her. It took the form of a solid silver highly ornate vase partly worked in silver gilt. Of course, despite the splendid performances of Lord Montagu and others, it was impossible in the circumstances that the new 45-h.p. models could carry off the Trophy or any of the important prizes in connection with it. In view of the exceedingly sportsmanlike attitude prevailing throughout, and especially among the members of the German committee, it is sad to reflect that their efforts should have been frustrated by a miscalculation. They have in every way been worthy of the Prince who is their distinguished patron and who has shown his interest in automobilism in taking part in what is undoubtedly one of the most severe trials of any organised in connection with horseless carriages. Moreover, frail and delicate though Princess Henry looks, she has followed her husband by car through every stage of the tour.

Already the lessons taught by this year's contest are likely to cause modifications in the future. It is understood that next year any car that emits vapours of ill odour or which is noisy shall be penalised. Another point which will have to be considered is the conduct of the honorary observers appointed by the club. This year an amazing amount of cheating took place, as an example of which it may be mentioned that in the timed hill climb those competitors who did not carry four persons in all had to take sandbags each to represent a person not carried. These were put on board at the starting line, but no examination took place subsequently. It is somewhat interesting to note that some of those sandbags were to be found cast on the roadside on the Semmering Pass and some within comparatively a short stage, but just out of sight of the timekeeper's box. Even in lesser matters it was observed even from the outset that no two controllers acted alike, and few of them seemed to know anything about the rules. Apart from such regrettable matters the competition has been fruitful of a store of pleasant incidents that will be happy memories for years to come. By Prince no less than commoner have we been treated with courtesy that could not possibly be surpassed. Mrs. Manville naturally received a great deal of attention, the committee presenting her at the finish with a superb wreath six feet in diameter and decorated with broad ribbons, one of each of the three national colours of the Clubs represented, viz., German, Bavarian, and Austrian. Perhaps the finest tribute she received was a large bunch of wild flowers from a ragged little urchin in Munich who presented them with the words, "I have been waiting ever so long to see you come so that I could give you these."

The Trophy has been remarkable for nothing so much as for roads and tyres—roads of a varying and bad nature for nearly half the distance, such as are eminently calculated to test tyres to the extreme, especially when driving at fast speed. "The competition will either make or mar the new non-slipping Continental tyre," said some motorists previous to the start, and in reference to the fact that seven-eighths of the competitors were using this sort. Punctures have been of the fewest, and in most cases the studs stand out as well for gripping purposes as when the sets were put in. In a word, the Continental Tyre Company are to be congratulated.

We have not brought the Trophy to England, but it has not been for the want of trying, nor for the lack of good cars, tyres, and drivers. H. M. B.

HERKOMER TROPHY.—Mrs. Edward Manville, who was the only lady driver in the large number of competitors for the Herkomer Trophy, was naturally the object of interest and admiration by all those who saw the admirable manner in which she handled her Daimler Car throughout. Prince Henry of Prussia, who, as a practical driver, appreciates skill in others, was one of the first to tender his personal congratulations to Mrs. Manville. The scene of our photograph above is at the start on the second day, at 6 a.m., at Linz on the stage to Vienna, when Prince Henry has taken the opportunity, whilst waiting for his turn to start, to have a chat with the plucky English lady driver. Mrs. Manville's 35-h.p. Daimler Car was the only car of the 133 running which was used last year in the Herkomer Trophy event.

Herkomer Trophy Results.

It was at the banquet—which, as last year, formed the concluding function—that the official results were announced as follows :—

1st.	No. 155.	Dr. Stöss, 18–20-h.p. Horch.
2nd.	No. 78.	E. Neumaier, 40-h.p. Benz.
3rd.	No. 18.	W. Pöge, 60-h.p. Mercedes.
4th.	No. 141.	H. Opel, 20-h.p. Opel.
5.	No. 93.	C. Neumaier, 40-h.p. Benz.
6.	No. 19.	H. Weingand, 70-h.p. Mercedes.
7.	No. 1.	T. Dreher, 90-h.p. Mercedes.
8.	No. 24.	E. Ladenburg, 70-h.p. Mercedes
9.	No. 144.	G. H. W. Uren, 20-h.p. Priamus.
10.	No. 102.	A. Horch, 40-h.p. Horch.
11.	No. 39.	A. D. Grigg, 35-h.p. Daimler.

The winner receives the Herkomer Trophy, to be held until the next race, a portrait of himself painted by Herr V. Herkomer, R.A., and the prize offered by the city of Munich.

The following obtained prizes for appearance :—W. Eschebach, 40-h.p. Benz; Wandlesleben, 24-h.p. Adler; K. Haase, 40-h.p. Adler; J. Livingstone, 40-h.p. Adler.

Herkomer medals were awarded to the following :—G. Klees (de Dietrich), Lord Montagu (Daimler), F. v. Reinhardt (Metallurgique), Dahmen (Benz), Brauda (Darracq), Mathis (Fiat), W. Opel (Opel), L. Roth (Benz), Flinch (Mercedes) receives two medals for cars 82 and 83 respectively, T. Dreher (Mercedes), Turck (Benz), Dr. Vebel (Benz), Weiss (Benz), W. Graf Arco (Mercedes), Kaldi (Benz), Wandlesleben (Adler), A. v. Frankenbeig (Bayard).

The following table gives the chief results of the speed trials :—

Semmering Hill.

		Marks.
1.	W. Pöge, 60-h.p. Mercedes	$3\frac{43}{60}$
2.	E. Neumaier, 40-h.p. Benz	$3\frac{35}{60}$
3.	C. Neumaier, 40-h.p. Benz	$3\frac{12}{60}$
4.	T. Dreher, 90-h.p. Mercedes	$2\frac{59}{60}$

Forstenrieder Park.

1.	Dr. Stöss, 18–20-h.p. Horch	$2\frac{39}{60}$
2.	Westphal, 18-h.p. Germain	$2\frac{11}{60}$
3.	G. Betzin, 18-h.p. Horch	$2\frac{1}{60}$

* * * *

A Gilbertian Magistrate.

Some recent proceedings before the Hayward's Heath Bench possessed the true Gilbertian flavour which by the way seems specially characteristic of automobile prosecutions. Of course, it was very wrong of a certain Mr. Fletcher to drive at 40 miles an hour, if he really did so, particularly at cross roads where a local authority had placed danger signals, and, of course, as the police said he did so, and the magistrates agreed with them, we *must* believe that he really committed this offence, for policemen never mis-estimate speeds and magistrates never impose undue confidence in their assertions. Still, as no harm apparently was done, it was a drastic penalty to inflict the sentence of a month's imprisonment without the option of a fine, and to suspend Mr. Fletcher's licence for six months. But it is when we proceed to the observations made by the Chairman, Major Dorrer, that we get the true essence of comedy, for the irate Chairman proceeded to explain that so much money had been spent on putting up danger signals that in future motorists who were *charged* with travelling at more than *ten miles* an hour over dangerous cross roads would be mulcted in the maximum penalty, and, he added, "the police will be instructed to charge offenders with driving to the danger of the public." Be it always and ever remembered that Major Dorrer says nothing whatever about *proof*, or even *conviction*. It is sufficient that the victims be *charged*, and the police are instructed to charge them, and then imprisoned they will be !

HIGH-TENSION MAGNETO IGNITION SYSTEMS.

(*Continued from page 729.*)

THE DE DION SYSTEM—(*concluded*).

The Induction-Coil, Contact-Breaker, and Distributor.

STANDARD design is followed in the construction of the induction-coil, which has one primary and one secondary winding wound on the laminated soft iron core. These windings are designed to operate equally well with the magneto, or with a battery of accumulators. They are enclosed in a wooden casing which has its terminals at the bottom, and is provided with a simple two-way switch and detachable plug-connection at one side. One of the most original features of the De Dion high-tension magneto ignition system is that the low-tension contact-breaker forms a separate unit from the magneto itself. It is, however, of the same pattern as those always fitted on those De Dion cars which have only battery ignition, and this fact not only simplifies the magneto itself, but renders the conversion of cars not already fitted with a mag-

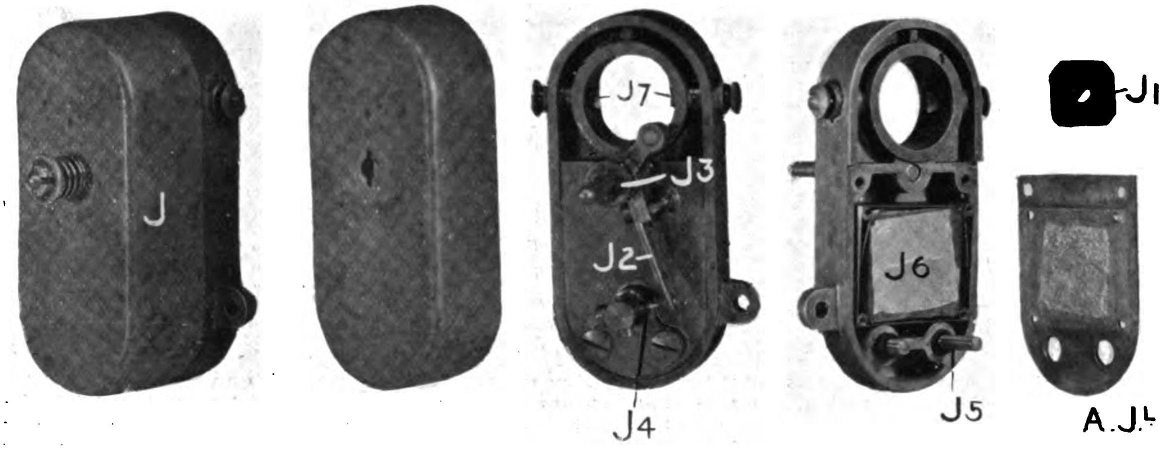


FIG. 4.—The De Dion High-Tension Magneto System. Views of the low-tension contact-breaker complete and with its cover removed. On the right the condenser, which is contained in the base of the contact-breaker, is shown in position, but with its cover removed.

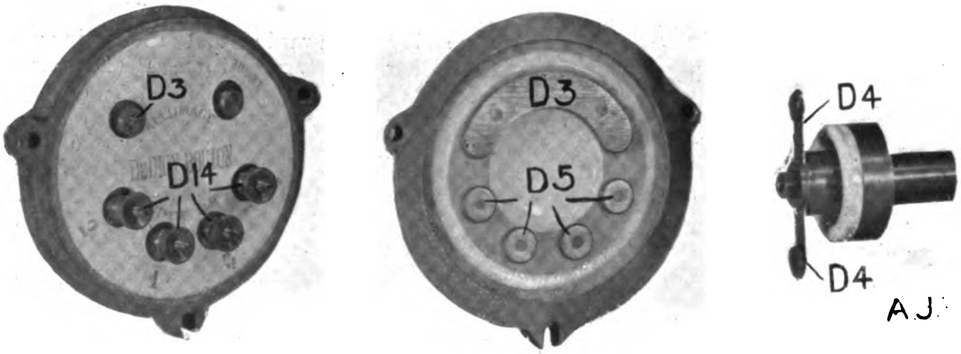


FIG. 5.—The De Dion High-Tension Magneto System. View of the high-tension distributor, showing the arrangement of the terminals, D^{14}, which are connected to the plugs, and of the contacts, D^5, which are connected to these terminals. On the right is the distributor brush, D^4.

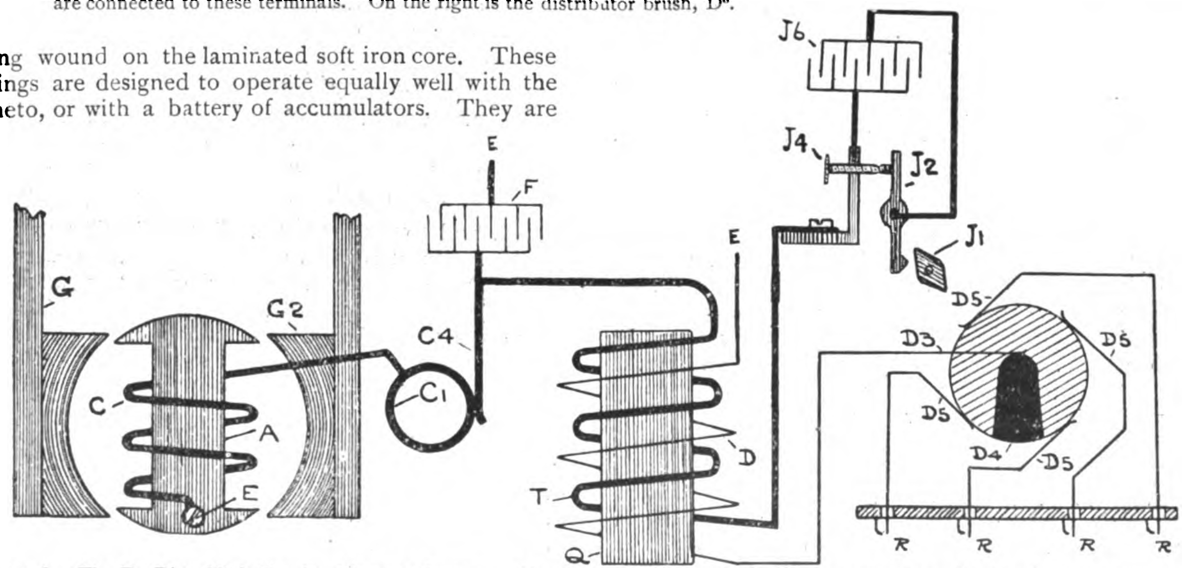


FIG. 6.—The De Dion High-Tension Magneto System. Diagram of the internal electrical connections, showing the arrangement of the two separate condensers across the armature and the contact breaker respectively.

neto a more simple matter than it might otherwise be. Several views of this low-tension contact-breaker are given in Fig. 4. It is designed with an ingenious form of spring-clip, J^7, which enables it to be easily mounted on the end of the shaft which carries the cam, J^1. This cam operates upon the pivoted lever, J^2, thus making and breaking the contact at the adjustment-screw, J^4. Contact is made positively, and it will be noticed that the blade, J^2, is formed by a spring, so that it can "give" slightly when being forced against the adjustment-screw. A coiled spring, J^3, mounted about the fulcrum on which the lever, J^2, is pivoted, causes the upper end of the lever to keep always in contact with the face of the cam, and it is, therefore, by means of this spring that the contact against J^4 is actually broken.

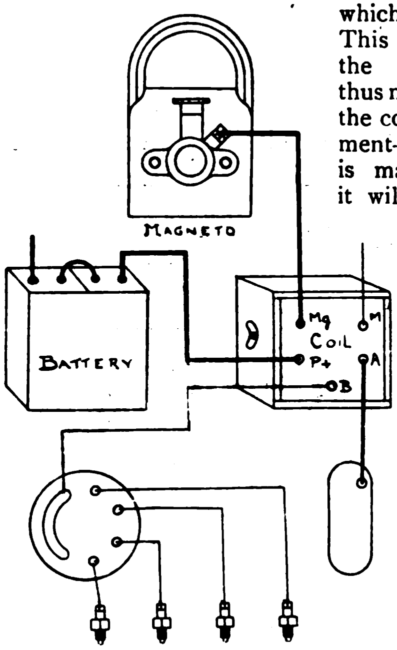


FIG. 7.—The De Dion High-Tension Magneto System. Diagram of the external electrical connections, showing how the magneto and battery are coupled up to the ignition plugs.

A curious feature of the contact-breaker used in the 4-cylinder outfit is that it is fitted with its own condenser, which is quite distinct from that fitted to the magneto. This condenser, J^6, is contained in the base of the contact-breaker, and is protected by a brass plate, which forms a cover for it. Its arrangement is clearly indicated in Fig. 4, and its position, electrically, in the circuit is shown in Fig. 6. Its purpose is to tone down the sparks which tend to occur at the contact points, and to destroy the platinum.

The high-tension distributor is also a standard fitting on all De Dion cars, and its design is such that it is only applicable to De Dion engines, because it does not, properly speaking, form an independent unit in itself. One part consists of a porcelain disc, which carries the distributor contacts, D^5, on its inner face, and the terminals, D^{14}, which are connected to them, on the outside. This porcelain disc is mounted in an iron ring, so that it can be attached in a suitable manner to the crank-chamber of the engine. The high-tension current is led directly to the quadrant, D^4, and it is distributed from this to the contacts, D^5, by the rotating brush, D^3, which is mounted on a spindle specially designed for use with these engines. Timing the ignition is performed, as usual in De Dion cars, by rocking the low-tension contact-breaker—all the other members remaining fixed.

The Battery Circuit and the Electrical Connections.

In the De Dion system it is rather the magneto which may be looked upon as the supplementary circuit, than the battery ignition, which has hitherto been fitted to all the standard cars. In any case, however, the battery introduces very little complication because the system has been essentially designed for its alternative use from the very commencement. Fig. 7 shows the connections which are necessary in order to couple up both the battery and the magneto in the circuit, and as they use the same primary winding and also the same low-tension contact-breaker, it has only been necessary to provide a simple switch for changing over from one to the other. In Fig. 6, the actual connections of the magneto circuit are shown separately, in order that they may be compared with the corresponding diagrams which appear in each of our articles on the various high-tension magneto ignition systems. These internal connections are remarkable for the arrangement of the main condenser, which is placed as a shunt across the armature-winding, instead of being in series with it, as is the more usual case. In this respect, however, it is similar to the Murray system which we described on January 14th last year. The condenser is charged by the armature current, and it discharges through the induction-

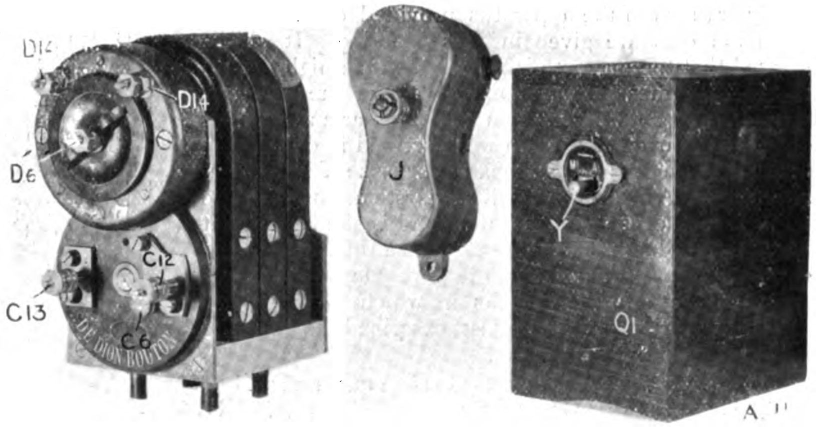


FIG. 8.—The De Dion High-Tension Magneto System. View of the complete outfit for a 2-cylinder car. In this set the magneto carries the high-tension distributor.

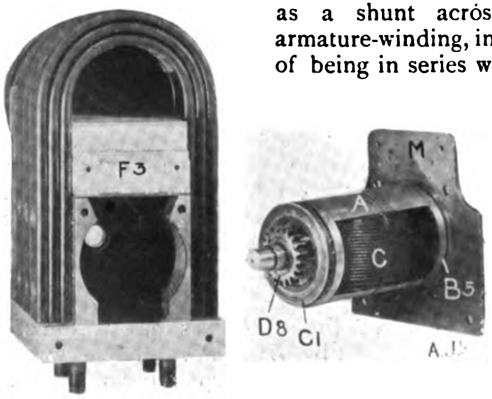


FIG. 9.—The De Dion High-Tension Magneto System. View of the "2-cylinder" magneto partly dismantled, the armature having been withdrawn complete with one of the bearing plates, M.

coil when the circuit is closed; afterwards producing its usual oscillatory effect when the circuit is again broken. As the armature-coil is not normally connected up in a closed circuit—on account of the particular type of contact-breaker employed—the presence of the condenser in this position allows the armature to do useful work, by charging it, prior to the time when the induction-coil is actually brought into action. It will be noticed that the oscillatory discharge of the condenser, F, which passes through the induction-coil, must flow through the spark-gap itself, because the small capacity of the other condenser, J^6, renders that alternative path practically negligible.

The 2-Cylinder Apparatus.

Illustrations of the apparatus provided on 2-cylinder De Dion cars are given in Figs 8 and 9. It will be noticed that the magneto is provided with a high-tension distributing mechanism mounted above the armature spindle, and gear-driven from it. This arrangement is exactly similar to that which we described in connection with the Bassée-Michel system, in our issue of November 4th, 1905. As with the 4-cylinder system, however, the contact-breaker is a separate unit, and is similar to that illustrated in Fig. 4, except that it has a different shaped cam, and is not provided with its own condenser.

Referring to further details in which this magneto differs from that we have just described, it may be pointed out that the live end of the armature winding is connected to a slip ring, C^1, mounted upon one of the armature end-plates, instead of being connected to a knob, as it is in Fig. 3. Against this ring, presses the carbon brush, C^4, which is held in the easily-accessible brush holder, C^6. In addition to the terminal, C^{12}, which is attached to the brush-holder bracket, there is another terminal, C^{13}, which is coupled up to the condenser in a manner which we fully illustrated and described in the issue referred to above.

Table of Reference Letters for the De Dion High-Tension Magneto System.

A	Armature core.	G	Magnets.
B	Revolving spindle (driving end).	G^1	Base plate.
B^1	Revolving spindle (free end).	G^2	Pole pieces.
B^5	End plates.	J	Contact-breaker box.
B^8	Jaw coupling.	J^1	Cam.
C	Armature coil.	J^2	Blade.
C^1	Slip ring.	J^3	Spring.
C^4	Collector brush.	J^4	Adjustment screw.
C^6	Brush-holder.	J^5	Terminal.
C^{12}, C^{13}	Magneto terminals.	J^6	Condenser.
D	Secondary winding.	J^7	Attachment clips.
D^1	Live terminal of D.	M	Bearing plate (driving end).
D^3	Feeder quadrant.	M^1	Bearing plate (free end).
D^4	Distributor brush.	Q	Induction coil core.
D^5	Distributor contacts	Q^1	Induction coil case.
D^6	Distributor spindle.	R	Ignition plugs.
D^8	Spur-wheel on B^1.	T	Primary winding of coil.
D^{14}	Terminals to plugs.	T^1	Live end of T.
E	"Earth."	Y	Switch bar.
F	Condenser.	Y^1	Switch terminals.
F^1	Live end of condenser.	Y^3	Detachable plug.
F^2	Spring contact.		
F^3	Case.		

⊛ ⊛ ⊛ ⊛

MOTOR BOATING.

Motor Yacht Club Race.

THE club handicap on Saturday, June 16th, resulted in a win for Mr. Geale Dickson's "Albatross." Mr. Seaton Edge's "Napier IV" was only 7 secs. behind, while Mr. A. G. Fentiman's "Javelin" was beaten by 5 mins., but was a similar amount in advance of the Rear Commodore's (Commander Mansfield Cumming) "Commander." The course was over a distance of 12 nautical miles, and lay round the Calshot Light and the Itchen gas buoy. The winner's elapsed time was 1h. 7m. 15s.

Liverpool Regatta.

PENDING a decision on the part of the committee, the prize in connection with the race for 40 ft. boats, which took place on Friday, June 8th, at Liverpool, has not, we are officially informed, yet been awarded.

Motor Boat Racing on the Seine.

SUNDAY last (June 17th) was the occasion of a motor boat fête organised by *Le Matin*. There was little in the way of incident, and no surprise performances. Over a course of 13·5 kiloms. "La Rapière II" won in the Racers' Section in 21m. 18s., "Delahaye" being second in 22m. 15s., with "Vol-au-Vent" third.

"Mendelssohn" won in Class I of the Cruiser Section by finishing the 10 kiloms. in 27m. 3s. In Class I "Nihil" was first, and "Calypso" won in Class III. In the "Extrareglementaires" Section "Dalifol" secured the handicap while running on paraffin. All the races in the cruiser section took place over 10 kiloms.

CLUBS AND ASSOCIATIONS.

Essex County A.C.

THE club gymkhana, at Colchester, on Saturday last, in aid of the funds of the Essex and Colchester Hospital, was highly successful.

Luncheon was served at the Cups Hotel, Colchester, prior to the competitions. Over one hundred persons were present, including the Mayor and Mayoress of Colchester, the deputy mayor and Mrs. Sanders, General Wynne, C.B., and Mrs. Wynne, Col. W. Howard (in whose grounds the gymkhana took place), and the Chief Constable of Colchester.

The gymkhana commenced shortly after two o'clock. There were six competitions, the winners of which were as follows:—Obstacle race, Mr. Burnett Tabrum, J.P.; ladies' passenger race, Mr. J. Hossoch; tortoise race, Mr. J. Gurney Fowler; starting and stopping race, Mr. F. C. Hill; Turk's head and pig sticking (open event), Mr. F. C. Hill; musical chairs, Mr. W. R. Fasey.

The band of the 2nd Dorset Regiment played during the competitions, and the prizes were afterwards presented by the mayoress. A sum amounting to nearly twenty-five pounds was collected for the hospital.

The next event of the club is a speed judging test to be held at Chelmsford on the 30th inst.

Lincolnshire A.C. Gymkhana.

A LARGE number of motorists, gathered from different parts of the county, on Saturday, June 16th, in the grounds of Monk's Manor, at the invitation of Col. J. S. Ruston, where a gymkhana had been organised by the Lincolnshire A.C. Over 40 cars were present, including Sir Hickman Bacon, Bart., on an 18-h.p. Wolseley, and Mr. and Mrs. C. A. Moreing on a 30-40-h.p. Daimler. The Bending Race was won by Dr. Gilpin on a 12-h.p. Richard-Brasier, and Dr. Purves, with Miss Wray as passenger, were successful in the "Musical Chairs." Dr. Gilpin won another event in the Starting and Stopping Race, while Dr. W. J. Jagger won the Obstacle Race with his Cadillac car. "Heads and Posts" followed, and was won by Dr. d'Eauvais on his 9-h.p. Oldsmobile, and the Ball Race, in which competitors had to drive round the course, and drop balls into various tubs, was won by Mr. G. W. Sandars, with Miss Sandars as his passenger, on a 4½-h.p. De Dion.

RACES, RECORDS, AND TRIALS.

SHELSLEY WALSH HILL CLIMB.—At Martley, the competing cars being weighed.

Shelsley Walsh Hill Climb.

ON Saturday, June 16th, the Midland Automobile Club held their annual hill climb in private grounds belonging to Mr. M. C. H. Taylor, at Shelsley Walsh. It was to many of the competitors unknown ground, and proved worthy, if its severity is to be considered in its favour, of this particular trial, which has always been somewhat above the general run of hill climbing competitions in importance. About 1 in 5 is said to be the severest part of the gradient, although the hill has not actually been measured, but there were two rather sharp bends near the top which did more to militate against high speed than the actual incline itself.

Quite a number of prominent motorists attended. Mr. Charles Jarrott went down on a 60-h.p. De Dietrich, the Maharajah of Tikari drove a 40-h.p. car of the same make, Mr. E. M. C. Instone and several others took over 35–45-h.p. Daimlers, while Mr. H. Luff Smith turned up at the other end of the scale with one of the new 5-h.p. 100-guinea Wolseley cars. Miss D. Levitt also enlivened the proceedings by giving an exhibition of her skilful handling of one of the big 50-h.p. Napiers. It was just as well, too, that this lady competitor was an old hand at the wheel, for her car skidded badly in rounding one of the bends, and in less able hands it might well have there and then swung over the cliff and dropped several hundred feet. In spite of having to de-clutch in order to set matters right, however, Miss Levitt actually got up the hill in 1m. $32\frac{3}{5}$s., or less than 12s. behind the fastest time, the honour of which performance fell to Mr. Frederic Coleman on his 18-h.p. White steam car. Mr. Coleman's ascent was indeed a splendid performance, and a tribute alike to his skilful driving no less than to the well-known attributes of the White cars. The second fastest time was made by Mr. E. M. C. Instone, on a 35–45-h.p. Daimler, and no fewer than three other Daimlers distinguished themselves by making times almost as fast. The actual results, however, were determined by a formula as follows:—

$$\frac{\text{Total weight in lbs.}}{\text{Time in seconds} \times \text{h.p.}}$$

and in the open competition the first three prizes all fell to 10-h.p. Allday cars, a similar vehicle winning in the closed section for club members.

The following tables give the results as determined by the handicap, and also the fastest times irrespective of class. The President's Cup is awarded to the winner of

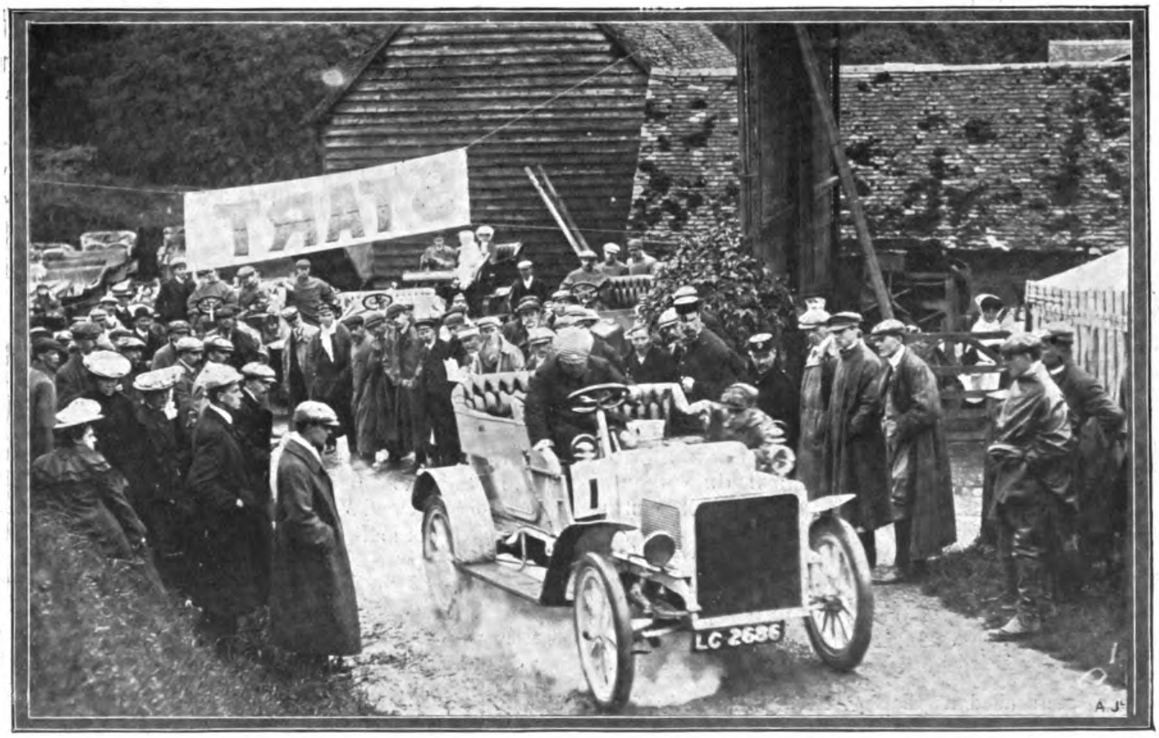
The cars marshalled at the foot of the hill, ready for starting.

The timekeeper's tent at the finishing point. In front is Mr. Ballin Hinde, on his left Mr. A. G. Johnson, and in the tent Mr. A. G. Sams, of the Midland A. C. Committee.

SHELSLEY WALSH HILL CLIMB.

	Bore.		Stroke.									
Open Event.	MM.	Inch.	MM.	Inch.	Cyls.	Bore^2.	$\sqrt[3]{\text{Str.}}$	H.-P.	mins.	lbs.	†	Result.‡
10-h.p. Allday (T. W. Huband)	—	3·75	—	4·5	2	14·06	1·65	9·28	205·6	2,296	20	1·203
10-h.p. Allday (E. J. Blakemore)... ..	—	3·75	—	4·5	2	14·06	1·65	9·28	209·8	2,310	21	1·186
10-h.p. Allday (S. Downing)	—	3·75	—	4·5	2	14·06	1·65	9·28	220·2	2,373	22	1·161
22-h.p. Minerva (J. A. Doran)	102	4·01	115	4·5	4	16·11	1·65	21·31	150·4	3,717	14	1·158
12–16-h.p. Talbot (H. W. Harris) ...	83	3·34	120	4·72	4	11·19	1·67	15·015	182·8	3,171	17	1·155
6-h.p. De Dion (G. Patterson)	90	3·54	110	4·33	1	12·55	1·63	4·09	347·4	1,631	26	1·148
14–18-h.p. Spyker (J. D. Wood)	90	3·54	100	3·93	4	12·55	1·57	15·83	179·4	3,213	16	1·131
12–16-h.p. Talbot (S. Kennedy)	85	3·34	120	4·72	4	11·19	1·67	15·015	194·8	3,262	19	1·115
8-h.p. De Dion (C. J. Newey)	100	3·93	120	4·72	1	15·5	1·67	5·205	362·2	2,072	27	1·110
10–12-h.p. Talbot (T. W. Bowen) ...	100	3·93	120	4·72	2	15·5	1·67	10·41	228·	2,583	24	1·088
10-h.p. Allday (N. Tailby)...	—	3·75	—	4·5	2	14·06	1·65	9·28	220·6	2,226	23	1·087
35-h.p. Daimler (E. M. C. Instone) ...	134	5·27	150	5·90	4	27·81	1·80	40·21	86·2	3,661	2	1·056
35-h.p. Daimler (F. A. Bolton) ...	134	5·27	150	5·90	4	27·81	1·80	40·21	88·6	3,724	3	1·045
35-h.p. Daimler (H. C. Holder)	134	5·27	150	5·90	4	27·81	1·80	40·21	91·4	3,836	5	1·043
35-h.p. Daimler (G. H. Street)	134	5·27	150	5·90	4	27·81	1·80	40·21	88·8	3,696	4	1·035
30–40-h.p. Daimler (C. Harmer)	124	4·88	150	5·90	4	23·83	1·80	34·45	111·6	3,941	10	1·025
12–16-h.p. Talbot (C. R. Garrard) ...	85	3·34	120	4·72	4	11·19	1·67	15·015	191·6	2,807	18	·9759
8-h.p. De Dion (E. G. Newey) ...	100	3·93	120	4·72	1	15·5	1·67	5·205	332·6	1,673	25	·966
60-h.p. Napier (C. A. Glentworth) ...	—	5	—	4	6	25	1·58	47·62	98·8	4.410	7	·9372
20-h.p. Rolls-Royce (F. C. Faulkner) ...	—	3·15	127	5	4	15·5	1·71	21·2	149	2,856	13	·904
35-h.p. Daimler (J. A. Holder)	134	5·27	150	5·90	4	27·81	1·80	40·21	103·8	3,710	8	·888
50-h.p. Napier (Miss D. Levitt)	—	5·50	—	5	4	30·25	1·71	41·38	92·4	3,374	6	·882
24-h.p. Beaufort (A. E. Oakley)	110	4·33	130	5·11	4	18·74	1·72	25·85	158·4	3,598	15	·878
60-h.p. Dietrich (C. Jarrott)	146	5·74	180	7·08	4	33	1·91	50·54	105·	4,417	9	·8324
40-h.p. Dietrich (Maharajah of Tikari) ...	140	5·51	138	5·11	4	30·36	1·72	41·79	123·4	4,291	11	·832
20–32-h.p. Darracq (G. F. Heath) ...	130	5·11	130	5·11	4	26·11	1·72	36·04	127	3,507	12	·766
12-h.p De Dion (W. Guilding)	100	3·93	110	4·33	2	15·5	1·63	10·11	415	3.143	29	·749
5-h.p. Wolseley (H. Luff Smith)	—	4	—	4	1	16	1·58	5·08	601·6	1,274	31	·4168
*18-h.p. White (F. A. Coleman)	—	—	—	—	—	—	—	—	80·6	3,136	1	—
Closed Event.												
10-h.p. Allday (C. E. Simms)	—	3·75	—	4·5	2	14·06	1·65	9·28	190·4	2,226	7	1·26
40-h.p. Napier (Cecil Edge)	—	4	—	4	6	16	1·58	30·475	121·6	4,508	3	1·217
10-h.p. Allday (S. Downing)	—	3·75	—	4·5	2	14·06	1·65	9·28	211·2	2,373	8	1·211
8-h.p. De Dion (E. G. Newey)	100	3·93	120	4·72	1	15·5	1·67	5·205	279·2	1,673	10	1·151
8 h.p. De Dion (C. J. Newey) ...	100	3·93	120	4·72	1	15·5	1·67	5·205	349	2,072	13	1·141
35-h.p. Daimler (H. C. Holder) ...	134	5·27	150	5·90	4	27·81	1·80	40·21	80·8	3,836	2	1·074
35-h.p. Daimler (E. M. C. Instone) ...	134	5·27	150	5·90	4	27·81	1·80	40·21	87·4	3,661	1	1·042
15–18 h.p. Siddeley (G. W. Grazebrook)	—	4·25	—	4	4	18·05	1·58	22·93	169	3,612	6	·932
10–12-h.p. Rover (E. N. Greaves) ...	75	2·95	100	3·93	4	8·71	1·57	10·98	212·4	2,086	9	·894
16–20-h.p. Rover (E. W. Lewis)	95	3·74	110	4·33	4	13·98	1·63	18·23	155·4	2,499	5	·882
20–32-h.p. Darracq (G. F. Heath) ...	130	5·11	130	5·11	4	26·11	1·72	36·04	123·4	3,507	4	·788
5-h.p. Wolseley (Luff Smith)	—	4	—	4	1	16	1·58	5·08	361	1,274	14	·694
12-h.p. De Dion (W. Guilding)	100	3·93	110	4·33	2	15·5	1·63	10·11	475	3,052	15	·635
14-h.p. Star (J. B. Jarvis)	—	3·5	—	4·5	4	12·25	1·65	16·17	287	2,422	11	·521

* Entered for fastest time only. † Time order. ‡ On formula.



SHELSLEY WALSH HILL CLIMB.—Mr. Frederic Coleman on his White Steam Car makes a fine start. Mr. Coleman did the best time of the day, 1 min. 20⅗ secs., and secured the Special Cup given by the President of the Club.

Mr. E. M. C. Instone on his 35-h.p. Daimler ready to start, with a full load.

Mr. J. E. Hutton waiting his turn on his 40-h.p. Berliet.

SHELSLEY WALSH HILL CLIMB.

the Open Handicap, but a second silver cup, also presented by the President (Philip S. Foster) is given to the driver ascending the hill in the fastest time, and has, therefore, been secured by Mr. F. Coleman. A gold medal is the award obtained by the first car in the Closed Section.

List of Fastest Times.

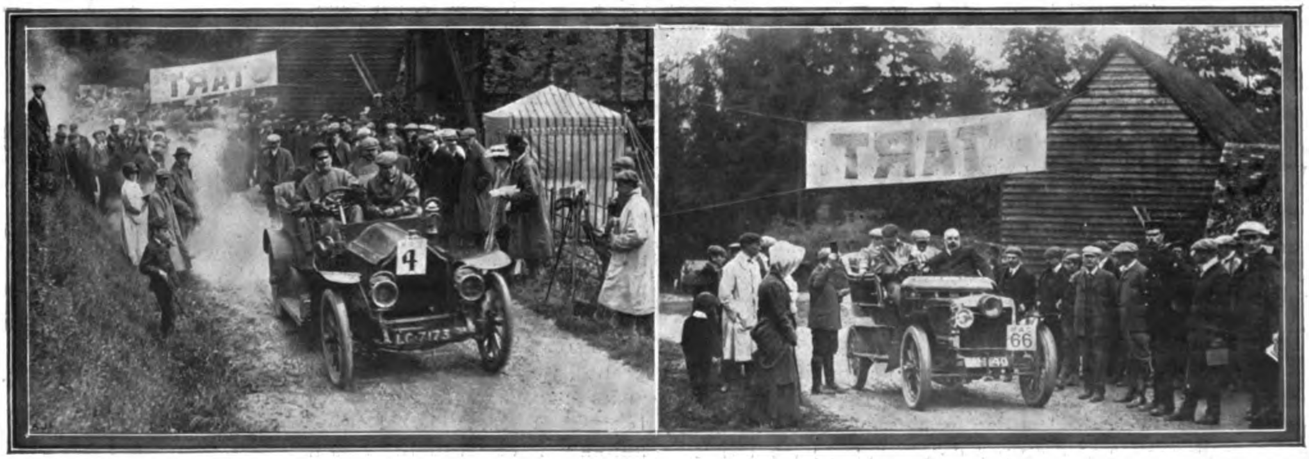
Place.	Car and Driver.	Time.	
		m.	s.
1	18-h.p. White (F. Coleman)	1	$20\frac{3}{5}$
2	35-45-h.p. Daimler (E. M. C. Instone)	1	$26\frac{1}{5}$
3	35-45-h.p. Daimler (Bolton)	1	$28\frac{3}{5}$
4	35-45-h.p. Daimler (Street)	1	$28\frac{1}{5}$
5	35-45-h.p. Daimler (C. Holder)	1	$31\frac{2}{5}$
6	50-h.p. Napier (Miss D. Levitt)	1	$32\frac{3}{5}$
7	60-h.p. Napier (Cecil Edge)	1	$38\frac{1}{5}$
8	35-45-h.p. Daimler (J. A. Holder)	1	$43\frac{4}{5}$
9	60-h.p. De Dietrich (C. Jarrott)	1	45
10	30-40-h.p. Daimler (Harmer)	1	$51\frac{2}{5}$
11	40-h.p. De Dietrich (Maharajah of Tikari)	2	$3\frac{3}{5}$
12	20-32-h.p. Darracq (Heath)	2	7
13	20-h.p. Rolls-Royce (Faulkner)	2	29

Schulte Cup.

Mr. J. W. Stocks, with his 8-h.p. De Dion, has been adjudged the winner of this cup, which was competed for in connection with the London to Edinburgh run, which took place on June 1st and 2nd, under the auspices of the Motor Cycling Club. In order to compete for this, the entrants had to also travel back to London from Edinburgh in a specified schedule time, the cup going to the competitor covering the double journey to Edinburgh and back to London closest to the time specified.

Grindleford Hill Climb.

On Saturday, June 16th, the Sheffield and District A.C.'s Annual Hill Climb took place, as before, on the road which runs through Padley Wood. From top to bottom this course has an average gradient of 1 in 17, but in places it rises to 1 in 8. There were two classes, one open to all, the other to private owners only. In all, twenty-six entries were received, and, except one, all came to the starting line. The non-starter was Mr. T. H. Firth's 12-h.p. Wolseley, which was, as a matter of fact, present, but the owner good-naturedly performed some semi-official duties for the club instead of competing. The results, as determined by the handicap, are not yet available, but the fastest times were made by Mr. A. Farnell on his 30-h.p. Daimler, and Mr. Thomas Nash's 18-h.p. Mercedes. Mr. Benjamin Hind, on a Clement-Talbot car, was only ten seconds behind the latter competitor.



Mr. Charles Jarrott gets away on his 60-h.p. De Dietrich Car.

Mr. C. Harmer waiting for the signal to start with his 30-40-h.p. Daimler.

SHELSLEY WALSH HILL CLIMB.

The Maharajah of Tikari.

Ightham Hill Climb.

THE annual hill climb of the Blackheath A.C., held on Saturday last, resulted in a somewhat small attendance, owing to the weather being somewhat unpropitious. The hill selected was at Hixeydown Road, Ightham, the length of the course being 1,377 yards, with a total rise of over 341 feet, and an average gradient of 1 in 12·09. Cars had to be the property of members of the club, and fully equipped with lamps, mudguards, &c. Cars were weighed with passengers at Sevenoaks, and the competition commenced at 5.30, Professor Carlton J. Lambert acting as starter, and Mr. Hugh Beadle as timekeeper. About a dozen cars were entered for the competition, the following being the result of the four fastest, according to formula, subject to confirmation by the judges :—

		mins.	secs.
1.	T. Marshall. 10-h.p. De Dion-Bouton	5	34⅘
2.	L. Beadle, 8-h.p. Regal	6	9
3.	W. Whiteway, 14-h.p. Regal ...	4	32⅕
4.	E. W. Stabb-Johnson, 7-h.p. Star ...	4	33⅗

Mr. Duckham has kindly promised to increase the value of the Challenge Cup from five to ten guineas, which is to become the property of the winner if won for three years in succession.

Lanchester Hill Climb.

UNDER the auspices of the North-Eastern Automobile Association, a hill climb was held on Saturday, June 16th, at Ragpath Side, near Lanchester. Although over fifty entries had been received, only fourteen in all turned up at the start, owing to the fearful rain. The hill is one of the worst in the county of Durham, the steepest portion having a gradient of 1 in 5·2. The test took place over a distance of half a mile.

Although the official results are not yet available, it was generally conceded that much the best performance was that of Mr. G. S. Barwick's Daimler car, although Mr. Leather's 40-h.p. Fiat was very little slower, while Mr. Ritson's "Stanley" steamer made the best performance in Class 8, and a 12–16-h.p. Wilson-Pilcher was first in speed in Class 7. It has been decided to re-run the event on July 7th.

Shelsley Walsh Hill Climb.—Mr. M. C. H. Taylor, by whose permission the hill climb took place in the private grounds of Court House, Shelsley Walsh.

Tourist Trophy Race, 1906.

IF there be any wavering entrants for this race, it would be as well for them to remember that Wednesday next, June 27th, is the last day for the receipt of entries at the ordinary fee of £20 per car. The fee from that day increases £2 per week up to and including Monday, August 27th. At present there are 34 entries for this race, which takes place on September 27th in the Isle of Man.

Town Carriage Contest.

IT is contemplated by the A.C.G.B.I. to hold a competition for town carriages, to include electric, steam, and petrol vehicles, in which an endeavour will be made to bring into consideration, in adjudging the awards, the following points :—Convenience, silence, smoke, smell, noise, ease of starting, and braking without jerks, running without changing gear, easy access to side-entrance, comfortable interior, and general appearance.

Special Steam Car Races.

THE Competitions Committee of the A.C.G.B.I. have been circularising the steam car manufacturers, with the object of ascertaining whether they would "be willing to enter cars for a special race for steam cars." Up to the time of the committee's last report only three replies had been received, and these all in the negative.

Circuit Européen.

IN May it was announced in THE AUTOMOTOR JOURNAL that there was little doubt but that the Circuit Européen would not be run this year at all, in spite of the fuss which has been made in regard to the great success which this European "scramble" was attaining. It is now officially announced by the A.C. de France that the event has been postponed until 1907.

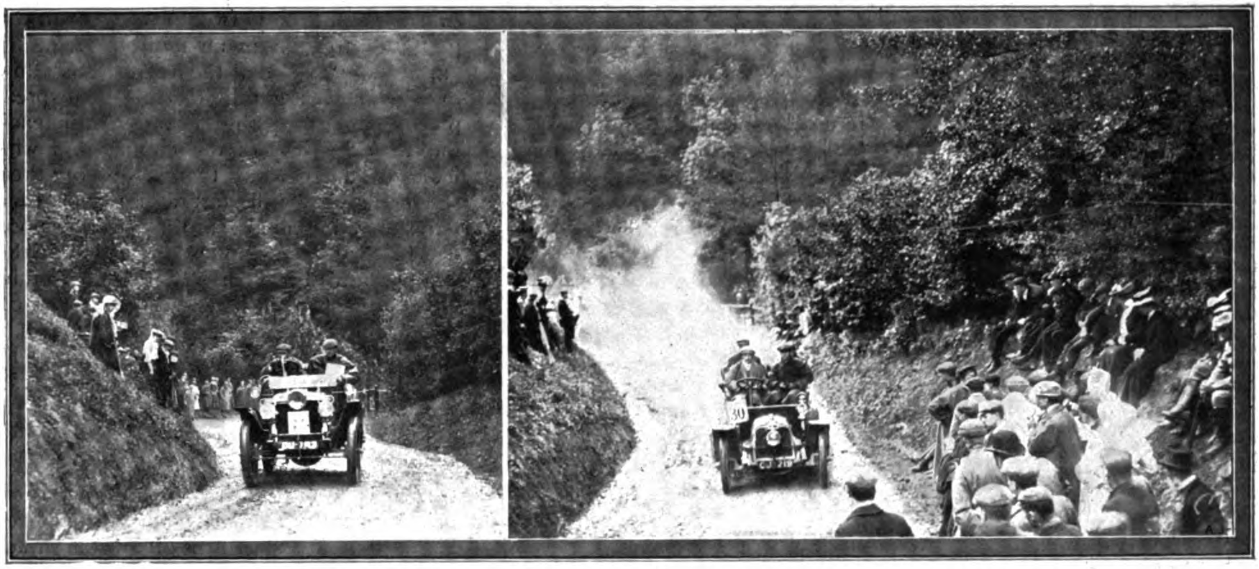
Speed Alone Not to be Recognised.

A MOVE in the right direction has at last been taken by the A.C. de France in officially notifying that for the future they will not authorise any races or contests in which speed is to be taken as the principal basis for classing the cars. Evidently a French Tourist Trophy Race is nearer consummation than we anticipated.

Coupe Provinciale Postponed.

OWING, it is stated, to difficulties with timekeepers and the withdrawal of some of the entered club teams, this important French inter-club contest, it is officially notified, has been postponed to some ulterior date. It was to have taken place on June 17th. This event was founded several years ago, and has annually brought together the leading automobile clubs of the South of France in friendly contest.

Shelsley Walsh Hill Climb.—Mr. E. M. C. Instone trudges up the rain-sodden hill to take notes of the cars.



Mr. F. A. Bolton negotiating the stiffest part of the hill with his 35-h.p. Daimler. Mr. T. W. Bowen taking the stiff gradient on his 10-12-h.p Clement-Talbot.

SHELSLEY WALSH HILL CLIMB.

The Grand Prix.

We publish this week a table giving particulars of the 34 cars which have been entered to take part in the Grand Prix on Tuesday and Wednesday of next week, a race which, as all the world knows, the A.C. de France have been hoping will absolutely extinguish even the memory of the old Gordon-Bennett. There are no British competitors, doubtless because the regulations governing the trials do not commend themselves to our motoring sportsmen. There are, however, some Italian vehicles taking part, and three German Mercedes are entered, the remainder being French. Most of the firms have availed themselves of the opportunity of entering three cars—the maximum number allowed—and a small but interesting innovation in the arrangements is that each car in such a team is to be distinguished by the same numeral, but prefixed with a different letter. Thus, for instance, instead of numbering the three Lorraine-Dietrich cars 1, 14, 25 in the ordinary way, they will now carry plates bearing the symbols A1, B1, and C1 instead.

It will be recollected that the Mercedes firm at one this time built a 6-cylinder engine for their cars entered in race, but as will also be seen from the table, that they have abandoned this scheme, and are using 4-cylinder engines instead. There is, on the whole, comparatively little of special note about the various cars. The Vulpés has its main frame suspended beneath the axles, while the Darracq has its change-speed-gear mounted upon the back axle. Neither of these systems, however, is a novelty on racing machines. Nearly all the engines have their cylinders cast in pairs, but the Panhard has gone in for steel cylinders with copper water-jackets, and the Bayard-Clement also has steel cylinders. Magnetos are being employed on every car, the majority being of the low-tension Simms-Bosch type, and it is a no less

SHELSLEY WALSH HILL CLIMB.—The Maharajah of Tikari passing the finishing point on his 40-h.p. De Dietrich.

SHELSLEY WALSH HILL CLIMB.—A group of interested spectators of the Hill Climb. In the centre of the front group the Maharajah of Tikari is seated, with Miss Dorothy Levitt on his left.

FRENCH GRAND PRIX, 1906.—PARTICULARS OF CARS ENTERED.

Car and Official Number.	Drivers.	Engine.					Transmission.			Dimensions.		
		Cy's.	Bore.	Stroke.	Speed.	Ignition.	Clutch.	Speeds.	Drive.	Wheel-base.	Track.	Weight.
h.p.			mm.	mm.	r.p.m.					m.	m.	kilogs.
130 Lorraine-Dietrich, A1, B1, C1	Gabriel, Rougier, and Duray ...	4	185	160	1,100	M	*lc*	4	CC	2·95	1·40	1,005
110 Fiat, A2, B2, C2	Lancia, Nazzaro, and Weillschott	4	180	160	1,300	M	*sc*	4	CC	2·84	1·35	995
105 Renault, A3, B3, C3	Sisz, Edmond, and Richez ...	4	165	150	1,200	m	*lc*	3	S	2·90	1·35	985
125 Darracq, A4, B4, C4	Hémery, Wagner, and Hanriot	4	180	150	1,200	M	*lc*	3	S	2·85	1·35	860
110 Brasier, A5, B5, C5	Baras, Barillier, and Pierry ...	4	165	140	1,380	M	*lc*	3	CC	2·75	1·35	1,000
125 Mercedes, A6, B6, C6... ...	Jenatzy, Mariaux, and Florio ...	4	175	150	1,300	M	*sc*	4	CC	2·92	1·36	1,000
110 Gobron-Brillie, A7	Rigolly	4	140	220	1,200	m	*ex*	4	CC	3·00	1·40	1,000
110 Itala, A8, B8, C8	Cagno, De Caters, and Fabry ...	4	180	145	1,200	M	*md*	3	S	2·95	1·40	1,000
70 Gregoire, A9, B9	Tavenaux and De Bosch ...	4	140	130	1,200	M	*lc*	3	S	2·70	1·25	750
130 Panhard, A10, B10, C10 ...	Heath, Teste, and Tart	4	185	170	1,100	m	*md*	4	S	2·85	1·40	1,005
120 Vulpés, A11	Barriaux	4	180	160	1,100	m	*md*	3	CC	2·80	1·44	1,000
125 Hotchkiss, A12, B12, C12 ...	Le Blon, Salleron, and Shephard	4	180	160	1,150	m	*lc*	4	S	2·65	1·45	1,000
125 Bayard-Clement, A13, B13, C13	A. Clement, Villemain, and Tourloubre	4	160	160	1,350	m	*md*	3	S	2·90	1·35	1,000

Explanation.—*Ignition.*—M = Low-tension Magneto; m = High-tension Magneto. *Clutch.*—*lc* = Leather Cone; *sc* = Scroll *ex* = Expanding. *md* = Multiple Disc. *Transmission.*—CC = Side Chains; S = Cardan Shaft.

important sign of modern development that as many as seven separate firms, who will be represented by no fewer than 20 cars, are using shaft-driven live-axles instead of side-chains. Four firms, the Darracq, Renault, Hotchkiss, and Vulpés have adopted wire wheels.

As our readers are already aware, the Sarthe Circuit has been chosen for this race, the cars having to cover a distance of about 600 kiloms. on each of the two consecutive days during which the trial is held. As an event, it is, of course, a purely racing contest, and the machines entered are, if anything, of even higher nominal power than was the case with those taking part in the old Gordon-Bennett. One of its most important deviations from the ordinary run of races is that even the tyres must be changed by the occupants of the car, no outside help being permitted whatever. There will, of course, be the usual depôts *en route*, but only two of these will be permitted to each manufacturer. A rather amusing detail is that the regulations allow of two men being told off for the express purpose of turning the starting handle each morning for any of the competitors who may care to avail themselves of their services. Cars will start at intervals of a minute, and on arrival at the finishing post, on the first day, will have to be driven straight into a garage, where they will be locked up for the night. Any vehicle which, on the first day, occupies more than four hours longer than the time taken by the fastest car in completing the course, will be disqualified from taking part in the second day's race.

French Heavy Vehicle Contest.

It is announced that for March, 1907, a similar contest to that which has just been concluded is to be run off over a much longer distance.

NORTH - EASTERN AUTOMOBILE ASSOCIATION HILL CLIMB.—Miss E. Barwick at the wheel of her 16-h.p. Daimler, with which she secured second place in Class 8.

MOTOR CYCLING.

LAND'S END TO JOHN O'GROATS.

Thirty-six of the 75 starters succeeded in completing the 889 miles which separates Land's End from John O'Groats, the starting and finishing points respectively, of the Auto Cycle Club's Reliability Trial. Such a feat should be a matter of congratulation for those who came through without accident, for the roads were not always good, and the daily stages were always of considerable length. It says much indeed for the pluck and endurance of Miss Muriel Hind that she, as the only lady competitor, should have been one of those who were successful, and this in spite of the bad luck which she experienced on practically every day of the trial. The passenger on her tricar was also a lady, but although they were often seen *en panne* by the road-side, they managed between them to always effect such repairs as were necessary, and, notwithstanding the delay, were able to arrive in good time at their destination. Under 50 per cent. is perhaps not, numerically, a very successful result, but it must be recollected that to cover nearly 1,000 miles on a motor cycle, in six consecutive days, is a performance which is creditable to any amateurs, and is something beyond the ordinary usage of the machines themselves, especially if they fail to receive those little attentions which do so much to prevent an actual breakdown, but are yet nothing more than mere adjustments in themselves.

Taunton formed the destination on the first day (Monday), the distance being 152½ miles, and this was followed on Tuesday by a run to Warrington, which is no less than 200 miles distant. This particular run was the longest of any, and largely for this reason, it must be also considered the most severe, for although the roads were not particularly hilly, and were in some places good and uninterrupted by corners and bends, yet the continued strain proved too much for all but the accomplished riders, so that few actually finished within the schedule time. So tired did one of the competitors become indeed, that, when he dismounted and jacked up his machine in order to make an adjustment, he suddenly fell asleep by the road-side. It was fortunate for him that he had been able to put himself and his machine in a place of safety before being overcome. Another competitor who had rather a curious, and what might have been a very unpleasant experience, was Captain Lestrange. Noticing that his machine was not going very well, he was only awaiting a suitable opportunity before dismounting to have a look round, when the cylinder-head suddenly blew off, and it was only the tank above that saved the rider from being hurt.

These two runs were accountable for the dismissal of twenty-eight riders, so that there were forty-seven left at the commencement of the third day's run of 143 miles to Lockerbie. Shap-Fell was included in the route, and proved a very severe test for most of the machines. Rain fell heavily at the start, and caused a little trouble through side-slip, but once the competitors had got well away from Warrington, the weather cleared, and the roads were found to be in good order. Miss Muriel Hind, who had been delayed by a puncture on the first day, and again met with mishaps during the second stage, was early the victim of further misfortune. First of all it was a lubricating-pipe which came adrift, the oil escaping on to the commutator, and thus interfering with the ignition. Having set this matter right, and having once more got under way, she was delayed again by the breaking of the chain. Two other tricars also came to grief, but more seriously, for the Armadale, driven by Mr. R. D. Bachelor, sustained a broken gudgeon-pin, while one of the Riley machines broke its frame.

From Lockerbie to Pitlochry, from Pitlochry to Tain, and from Tain to John-O'Groats, formed the three daily stages of the latter half of the trial, but the first section of the run had evidently been quite severe enough to weed out the majority of the weaklings as but nine others succumbed during these three latter days. Mr. Wright's Durkopp was put out of running through trouble with the connecting-rod, and although Mr. Godfrey was delayed by a similar breakdown on the part of his Werner, he was subsequently able to proceed. Mr. E. W. Ashworth met with a nasty accident; it was while travelling between Lockerbie and Pitlochry, when his wheel caught in a rut, so that he was thrown over his handle-bars. Although shaken, he was able to proceed, however, for neither himself nor his machine had been seriously damaged, and he actually succeeded in finishing the run to schedule time. Mr. A. H. Albert, who was driving a 6-h.p. Quadrant, had particularly bad luck on the last day, although everything had been going well until then; a leaky valve in the rear tyre made it necessary for him to dismount every two or three miles in order to pump up. Wearying of this performance, however, he subsequently took the tyre off, and rode the last 70 miles on the rim. Mr. F. W. Applebee, driving the 3⅜-h.p. Rex, ran out of petrol when only 11 miles from the finish, and although he tried to complete the journey by using paraffin, the experiment did not prove a success, and he had to send back some miles for petrol, and was consequently unable to reach John O'Groats until late in the evening.

Tyre troubles, as usual, were accountable for many of the delays. Mr. Harold Bowden, for instance, who was driving a 6-h.p. Raleighette, having no less than sixteen punctures between Land's End and Worcester, which town is about 250 miles from the start. In spite of the fact, therefore, that his machine was running well, he was forced to abandon the contest, for he was by that time so far behind time that it would have been hopeless to continue. The list of those who successfully accomplished the ride is as follows, all of whom, with the exception of those marked (*), received gold medals:—

A. B. Albert (3½-h.p. Quadrant), W. Harrison (3½-h.p. Quadrant), A. Williams (3½-h.p. Quadrant), W. H. Wells (5-h.p. Vindec), T. Woodman (5-h.p. Vindec), H. G. Cove (2¾-h.p. De Dion), H. E. Blackney (4-h.p. Werner), P. C. Campiorale* (3⅜-h.p. Rex), M. J. Tuchmann* (3-h.p. Quadrant), Rev. B. H. Davies (3-h.p. Triumph), J. Tassell (3½-h.p. Matchless), E. W. Ashworth (4-h.p. Werner), F. Hulbert (3-h.p. Triumph), S. Bramley Moore (3-h.p. Triumph), W. Brough (3½-h.p. Brough), J. F. Dixon* (3½-h.p. Bradbury), R. M. Brice (3½-h.p. Brown), W. Milnes (2¾-h.p. Phelon-Moore), R. Moore (3½-h.p. Phelon-Moore), W. G. Brooks* (5-h.p. Rex), S. W. Carty (3½-h.p. N.S.U.), H. L. Cooper (3-h.p. Triumph). A. W. Browne (7-h.p. Lurquin-Coudert), D. Poupart (3-h.p. Fafnir), F. E. Cox* (5½-h.p. G.B.), F. W. Applebee* (3⅜-h.p. Rex), W. Hayes (5-h.p. Rex), H. S. Ruddle* (5-h.p. Onaway), G. W. Blackaller (3½-h.p. Quadrant), H. R. Dougal (4.h.p. Stevens).

Tricars.—H. G. Priest (6-h.p. Quadrant), A. H. Albert* (6-h.p. Quadrant), J. Van Hooydonk* (6–7-h.p. Phœnix), Wilbur Gunn (10-h.p. Lagonda), A. Carpmael, jun. (9-h.p. Riley), and Miss Muriel Hind* (9-h.p. Singer).

It was by the aid of a 16–20-h.p. Humber car and an 8-h.p. Wolseley car that the officials and the Press were enabled to keep in touch with the competitors at all points along the route The Humber car went through without mechanical trouble of any kind and the Wolseley had but one brief delay in repairing a chain.

London to Edinburgh Awards.

The following have been awarded the Motor Cycling Club's Gold Medal in the recent twenty-four hours' run from London to Edinburgh, particulars of which were given in The Automotor Journal of June 9th, page 710:—

Motor Bicycles.—Ashworth, D. S. Baddeley, L. A. Baddeley, Badenock, Bailey, Bellenger, Blackney, F. M. Bond, H. M. Bond, R. G. Booth, Brice, Campbell, Drummond, Freeman, Frost, Godfrey, Goslett, Hart, Hulbert, Hull, Jacobs, Mussett, Reynolds, A. Sale, Shutes, Sproston, Tuchmann, Webb, Wells, Williams, Wright.

Tricars.—Earp, Gunn, Miss M. Hind, J. Van Hooydonk.

Cars.—Platt Betts, A. J. Brown, C. W. Brown, F. J. Jenkins, Peckham, Price, Sewell, J. W. Stocks, H. Taylor, Miss A. Wood.

SHELSLEY WALSH HILL CLIMB.—Miss Dorothy Levitt and her two companions take a walk—not a "cake walk"—up the hill.

Shelsley Walsh Hill Climb. — Mr. Frederic Coleman is well protected against the elements.

A.C.G.B.I. Honorary Membership.

During their residence in Great Britain, the Ambassadors for Spain, France, Turkey, and Russia have severally been elected to honorary membership of the A.C.G.B.I.

Beware!

Several traps are notified on the Bath Road in the neighbourhood of Maidenhead. A correspondent writes that there is no safety between Slough and Twyford. The proverbial prejudice of the Maidenhead Bench against motorists would counsel the avoidance of this district by the slowest-going motorist, for the present.

Lifeboat Saturday.

In connection with the demonstration for Lifeboat Saturday on June 23rd at Greenwich, a procession of decorated motor cars, trolleys, &c., will make a tour of the borough, a prize of five guineas being awarded to the best decorated car. The procession will start from South Street, Greenwich, at 2.30 p.m.

One of the Results of Persecution.

Mr. F. W. Cornwallis-West, who was recently being conveyed slowly and carefully in his motor car home from a hospital where he has just been recovering from an operation, fell into a police-trap, and his driver was charged with proceeding *exactly* at the rate of 26 miles an hour. The driver was fined £5, which Mr. Cornwallis-West paid, very naturally and properly observing that "this kind of thing was persecution and not prosecution," and that, if it continued, he certainly would refuse any longer to subscribe to the Widows' and Orphans' Fund of the Metropolitan Police.

A Road to Avoid.

The road behind the sea bank from Sutton-on-Sea to Chapel St. Leonard's, *via* Anderby, has been declared unfit for motor cars by the committee of the Leicestershire A.C., and motorists generally are urgently requested not to use it. The Lindsey County Council has applied to the Local Government Board for this road to be closed to motor cars. As no roads within the county have yet been officially "closed," and as the club is erecting warning boards on this road, it is hoped to avoid a precedent being established if members and others will avoid using it. The road is merely a sandy track, and has fifteen gates across it. There is an excellent alternative road *via* Huttoft.

Police Amateur Timing Methods.

Mr. Chilcot, of "Level Dene," Windsor Forest, who appeared in his own defence, was brought up recently before the Windsor Bench, and charged by the police with exceeding the speed limit. The case revealed the same old tactics in the police trap with which we have been familiar for the last five or six years. He was said to have covered a measured quarter of a mile in exactly 30½ secs., which worked out at 29 miles an hour. Mr. Chilcot was absolutely certain that the car was travelling at only 12 or 15 miles an hour, so he induced the police to re-time the car over the same stretch, Mrs. Baring (who was travelling in the car with her daughter) and the chauffeur inspecting the policeman's method of doing so. Mrs. Baring observed the policeman's methods, and found that he did not start his watch till some time after the starting signal had been given. The magistrates, without making any comment, dismissed the case.

A Record by King Alfonso.

King Alfonso of Spain has added to his marriage, and his miraculous escape from the anarchist assassin, the further exploit of having established an automobile record. Accompanied by Queen Victoria, he is reported to have driven his 60-h.p. Panhard car from Madrid to Segovia, a distance of 94 kiloms., in 1 h. 12 mins. Owing to the loss of time at the tremendous Perdrix Hill, it was calculated that King Alfonso must have travelled at times at more than 110 kiloms. an hour in order to cover the distance of 94 kiloms. in the time mentioned. King Alfonso is being applauded by most of his automobile confrères in Spain, but the "potent, grave and reverend seigneurs" who have been for so long shaking their heads over his doings, have given them an extra wag this time, and are loudly complaining of the "temerity" of their monarch.

AN ARGYLL PRIZE WINNER.—Recently we announced that the first of the driver's prizes, under the scheme which Argylls, London, Limited, inaugurated for running a distance of 5,000 miles at a maximum specified cost, had been awarded. This was obtained by Mr. W. W. Perks, who has been driving a 10-12-h.p. Argyll Car for Messrs. MacDowall, Steven and Co., of Upper Thames Street. Mr. Perks has been able, whilst running this car over a distance of 5,000 miles, to keep his total cost at the low sum of 1·181*d.* per mile. Above we give a photograph of Mr. Perks at the wheel of this car. The detailed costs, &c., were given in the "Automotor Journal" of May 12th.

Simplon Pass and Motorists.

THE Swiss authorities have issued regulations in regard to motorists crossing the Alps *via* the Simplon Pass. Cars will not be allowed to cross at night. Otherwise the rules provide that during June and September the Pass will be open to motorists on Sunday, Tuesday, Wednesday, and Friday. On the other days animal traffic alone will be permitted. During July and August the Pass will be open to motor traffic each day except Thursday. Permits must be obtained from the gendarmerie at Bregue or Gondo, and the time occupied must not be less than four and a half hours.

Put it on the Motor Car.

M. LAURENÇON, the defeated candidate for Briancon, in the last French election, is bringing an action against the Societé des Automobiles. During the election he hired a car from this company to carry on the campaign with, and the car behaved so badly that M. Laurençon attributes his loss of the election, in which he was opposed by a Socialist, to this behaviour of the car. Will it be believed that M. Laurençon positively thinks he has a ground of action because he thinks he otherwise would have won the election? Evidently anyone who wishes to become a librettist on the lines of Mr. W. S. Gilbert, should spend a portion of his time, at any rate, in studying French law cases.

Important Sign for Motorists.

IN view of the difficulty sometimes experienced in getting tyre troubles rectified by wayside repairers, it is interesting to note that Messrs. Harvey Frost and Co. have issued to all efficient tyre repairers who use their H.-F. vulcanizing process, a special enamelled hanging sign. The sign is a guarantee to the motorist that his tyres will be properly attended to in case of need, and every repairer exhibiting the sign has already gained Messrs. Harvey Frost and Co.'s approval of specimen repair work submitted for their inspection. No sign is delivered unless the applicant has already done some repair work to Messrs. Harvey Frost and Co.'s satisfaction. Motorists will do well to look out for the sign, which safeguards them from incompetent repairers, and ensures that tyre repair work of all kinds will be thoroughly well done.

Beyond Comment.

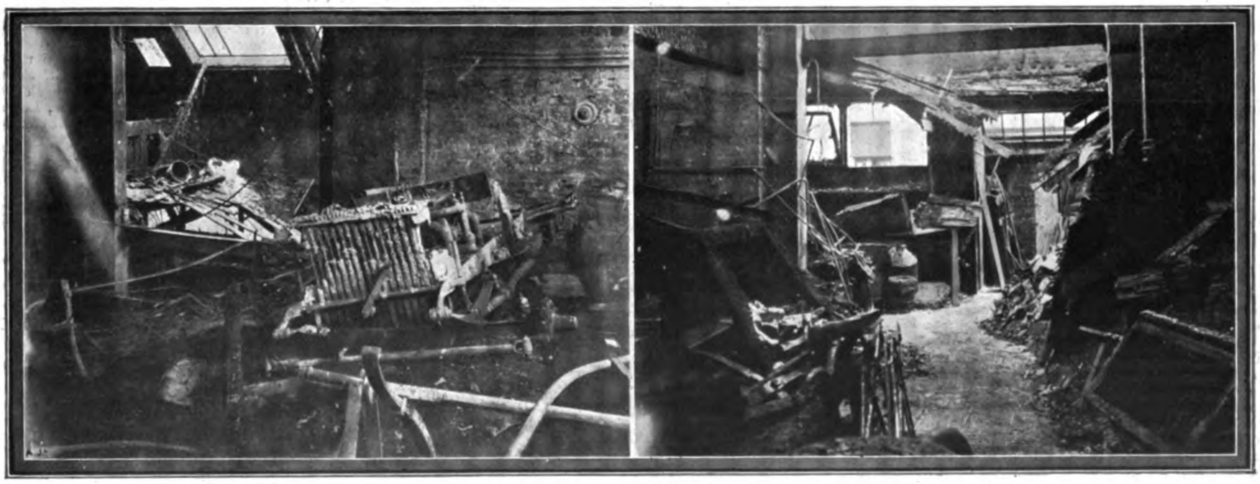
THE following report of the latest tactics employed by the Beaconsfield Police is from the daily Press of June 19th:—

> MOTORISTS AND POLICE.
>
> At Beaconsfield Police Court yesterday, a cyclist in the employment of the Automobile Association was summoned for "not giving warning by ringing his bell while passing persons in the road."
>
> The occurrence took place on the Bath Road near Taplow, and the evidence showed that at the particular point the road was 21 ft. wide—on the right hand side was a path 6 ft. wide, and on the left was a large open space of grass. It appeared that the only persons in the road were two constables, who had been engaged in trapping motorists. The cyclist passed these men at a distance of six or seven feet, at the "furious" speed of four miles an hour. The defendant had previously been interviewed by another constable, who stated that the defendant would be summoned for obstructing the road for speaking to a motorist a quarter of a mile beyond the trap. This summons was, however, not issued.
>
> The cyclist was defended by Mr. Walter Payne (instructed by Messrs. Amery-Parkes and Co., solicitors to the Automobile Association.
>
> The magistrates dismissed the summons, and awarded costs against the police.

More Evangelisation by Motor Car.

GENERAL BOOTH seems more than ever determined to disprove Ruskin's dictum that missionary work could not be done well faster than at a walking pace. He was so satisfied with the effect of the motor car tour last year, which we noticed from time to time as it proceeded, that what is being described as "Another Pilgrimage by Petrol" through Cumberland, Westmorland, Cheshire, and Lancashire, commencing at Keswick during the dog-days, viz., the 8th of August, has been arranged. General Booth will address meetings in all the principal towns, and he has also arranged to address meetings every morning and evening during the tour at places widely distant from one another.

The Rev. F. B. Meyer, President of the Baptist Union, is also following the example of General Booth, and, accompanied by the Secretary of the Union, he intends making an autoevangelistic tour through Bedfordshire, Oxfordshire, and Cambridgeshire, for the purpose of organising or reorganising Baptist communities in those counties. This tour is to commence on the 16th of July.



In the early hours of Wednesday morning last week, a disastrous fire took place in Little Portland Street at the manufactory of Messrs. W. and F. Thorn, the coachbuilders, who are now well known in connection with the motor trade. The whole of the premises were completely gutted and some valuable motor cars were included in the disaster. Our photographs give some idea of the havoc created, and it would require somewhat of an expert to identify, in the remains of the motor car shown in one of our photographs, a high-powered Mercedes of the day before the fire.

COMPANY DOINGS.

A. Darracq and Co., Limited.—The directors of A. Darracq and Co. (1905), Limited, have declared an interim dividend on the ordinary shares at the rate of 2*s*. per share.

NEW COMPANIES REGISTERED.

Dook-Swain Tyre and Rubber Co. (Ltd.), Soho Works, Pollard Street, Ancoats, Manchester.—Capital, £8,000 in £1 shares. First directors, Dr. W. Yates, E. Yates, H. Bowker, E. A. Dook, L. H. Swain, A. C. Wilby, and E. A. H. Drury.

Improved Motor Omnibus Co. (Ltd.), 78, Hamilton House, Bishopsgate Street Within, E.C.—Capital, £100 in £1 shares. First directors, G. T. B. Cobbett, F. Searle, and C. L. Nordon.

Joseph Gibson and Co. (Ltd.), Unity Works, Bell Street, West Bromwich.—Capital, £20,000, in £1 shares. Objects, to acquire the business of axle, spring, &c., manufacturer, at West Bromwich, from Joseph Gibson and Co. First directors, F. W. Padmore, Kate F. Gibson, and J. S. Gibson.

Motor Carburettor Syndicate (Ltd.), 20, Eastcheap, E.C.—Capital, £4,000 in £1 shares. Chief object, to adopt an agreement with G. L. W. Dorwald. First directors, J. Chapman, F. W. Darch, and A. H. Crickmay.

Smallwood's Motor and Cycle Co. (Ltd.).—Capital, £7,000 in £1 shares. Objects, to acquire the business carried on at 52, Corporation Road, Middlesbrough, and 13, Queen Street, Redcar, as W. J. Smallwood, of makers of cycles, motors, &c. First directors, G. R. Kidd, H. Gale and W. J. Smallwood.

Triumph Co. (Ltd.).—Capital, £100 in £1 shares. Manufacturers and vendors of cycles, motor cars, &c.

Whitworth Vale Motor Omnibus Co. (Ltd.), Market Street, Whitworth, near Rochdale.—Capital, £10,000 in £1 shares. First directors, J. Butterworth, J. Hill, W. Holt, H. Patchett, J. B. Robinson, and H. K. Taylor.

COMMERCIAL POINTS.

We notice that Mr. Charles Mandell is offering for sale by public auction, next Thursday, the lease and goodwill, together with the engineering plant, machinery and effects of the Iden Motor Car Company, Ltd., of Coventry. The sale will take place at the Iden Works.

It is a curious and significant fact that seven of the successful vehicles in the Tour de France were fitted with De Dion engines. Four of these were the only voiturettes to complete the course, the others were tricars. It will be remembered that the Vulpès gained first place, and this had the De Dion engine numbered 19,550.

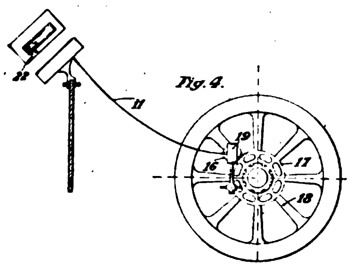
The two "Matchless" machines, which secured first and second places in the English Selection Trials for the International Cup Race, and which covered the whole course—a distance of 121½ miles—at racing speed, were fitted with Dunlop tyres, which went through without the least sign of trouble.

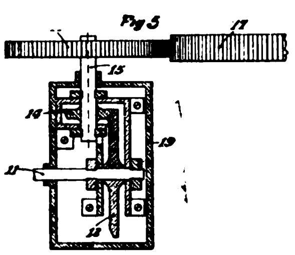
⊛ ⊛ ⊛ ⊛

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

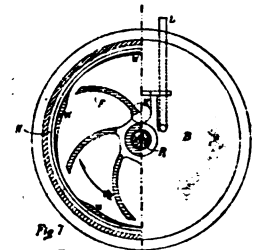
The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

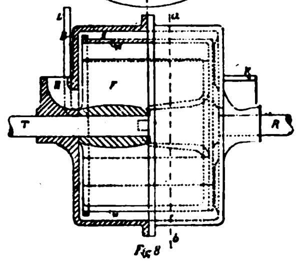
13899. 5th July, 1905. Improvements relating to Route Indicating Devices for Road Vehicles. Adolphe De Berghe, of 32, Rue Labouret, Colombes, Seine. This invention consists of an automatic mechanical device, the movement of which is obtained by an appropriate transmission through the wheels of a motor or other vehicle, and which has for its object the unrolling as it proceeds of a route card in strip form arranged under the eyes of the driver, so that the point of the route reached by the vehicle is always shown on the strip. The apparatus being intended for a motor vehicle should be driven at a speed proportionate to that of the vehicle. Now, if the transmissions hitherto known were adopted, it would be necessary to drive the apparatus off the driving wheels. Driving wheels are liable to skid frequently, and the result would be that the place indicated on the map would not be the actual place. It is, therefore, necessary to operate the map off the steering wheels, and to this end flexible transmission means have been adopted in the present arrangement. Fig 4 is a general view showing the method of transmission of the movement of the wheel to the mechanism. Fig. 5 is a detail section of this transmission, upon a larger scale. The mechanism operates in the following manner: a flexible connection, 11, rotated by a wheel of the vehicle by means of a bevel gearing, transmits its movement to a train of reducing gear wheels, which drive the feed roller at an appropriately reduced speed corresponding to the scale of the card. The flexible connection, 11, carries at its lower extremity a bevel gear wheel, 13, meshing with another bevel wheel, 14, carried by an intermediate shaft, 15, upon which is fixed a pinion, 16, meshing with a pinion, 17, with the wheel, 18. The bevel gear wheels, 14 and 13. and also the supports of the extremity of the flexible connection, 11, and of the spindle, 15, are enclosed in a case, 19, which is preferably fixed in the case of a motor vehicle upon the arm of the steering bar.—May 17th, 1906.





12457. 15th June, 1905. A Hydro-pneumatic Power-transmission Apparatus. Jules Lecoche, of 42, Rue Sadi-Carnot, Armentières (Nord). This invention relates to a power-transmission apparatus, applicable to motor vehicles, of such construction that it works together as a fly-wheel, as a progressive clutch, or as transmitting either the total power of a constant speed motor to a variable resistance by automatically communicating to the latter the maximum speed it is susceptible of according to the power of the motor. The characteristic feature of this apparatus is that the transmission of power is effected by a liquid (water or oil) set by the motor in rotatory motion inside of a cylindrical casing. This liquid acts on one or both sides of a set of wedges by the pressure derived from its own centrifugal force, together with the atmospheric pressure that it transmits, since, adjacent to the head of each wedge, it leaves a vacuum space through hydro-pneumatic suction. There are eight figures. Fig. 7 shows an end-view and cross-section *a b* (Fig. 8) of an apparatus of the single drum construction with action of the liquid on both sides of the wedges. The transformation of speed in impulse force is according to the following principle: If, inside of a drum, the walls of which are smooth, a liquid revolves at a quick speed, which takes but a very small power. it gives a centrifugal force exerting on the walls of the drum a considerable pressure. Then, if a number of slender wedges, W, are fixed on the inside of the drum, the resultant of the centrifugal pressure exerted on these wedges by the liquid revolving in the same direction as the arrow will be a tangential force of the same direction. Besides, the liquid in quick motion produces a vacuum in the space adjacent to the head of the wedge, and atmospheric pressure, exerting through the liquid, is added to the centrifugal pressure. Moved by this impulsive force, the drum revolves, transmitting the power of the liquid. When a part only of the power of the motor is to be transmitted, the impulsive force is reduced by expelling out of a drum a quantity of liquid through a delivery cock. the apparatus acting as a centrifugal pump. The liquid fills again the drum by opening an inlet cock. T represents the motor shaft, R the transmission shaft. The ends of these two shafts enter the cylindrical casing, B, along its centre-line and meet at its centre. On the end of T is fixed a fan fly-wheel, F, of any proper shape and design, the purpose of which is to give to the liquid a steady rotary motion inside of the casing, B. On the end of R is fixed the transmitter, bearing a number of wedges, W, as above described. A space, N, is left between the transmitter and the casing for allowing the liquid to be expelled, when required, through the pipe, K, to a tank (K can be placed in any position suitable for its delivery purposes), a cock is fitted to K for this purpose. Another pipe, H, also provided with a cock, allows the inlet of liquid into the casing. These cocks can be combined in one three-way cock. A pipe, L, puts the central part of the apparatus in communication with the atmosphere.—May 17th, 1906.





Patent Specifications Published.

Applied for in 1905.

Published June 21st, 1906.

11,150.	J. Birch.	Motor tricar forecarriage.
11,167.	E. D. Baguley.	Transmission gear.
11,676.	Wade and Jones, Ltd., and F. R. Wade.	Carburettor.
13,443.	J. B. Le Maitre.	Tyres.
16,570.	G. K. Hartung.	Storage batteries.
16,824.	Albion Motor Car Company and T. B. Murray.	Power regulator.
17,219.	A. S. Moore.	Devices for preventing slipping.
23 868.	J. Partington.	Resilient wheels.

Applied for in 1906.

Published June 14th, 1906.

848.	J. Chalmers.	Change-speed-gear.
878.	P. Jörgensen.	Four-stroke cycle intl. combn. engines.
3,121.	P. Winand.	Method of producing oxygen for intl. combn. engines.
5,162.	M. Fischer and A. Hommel.	Devices for securing motors in motor vehicles.
5,332.	S. Russell and H. [illegible]cton.	Motor lamps.
6,064.	A. Watkinson.	Anti-skid device.

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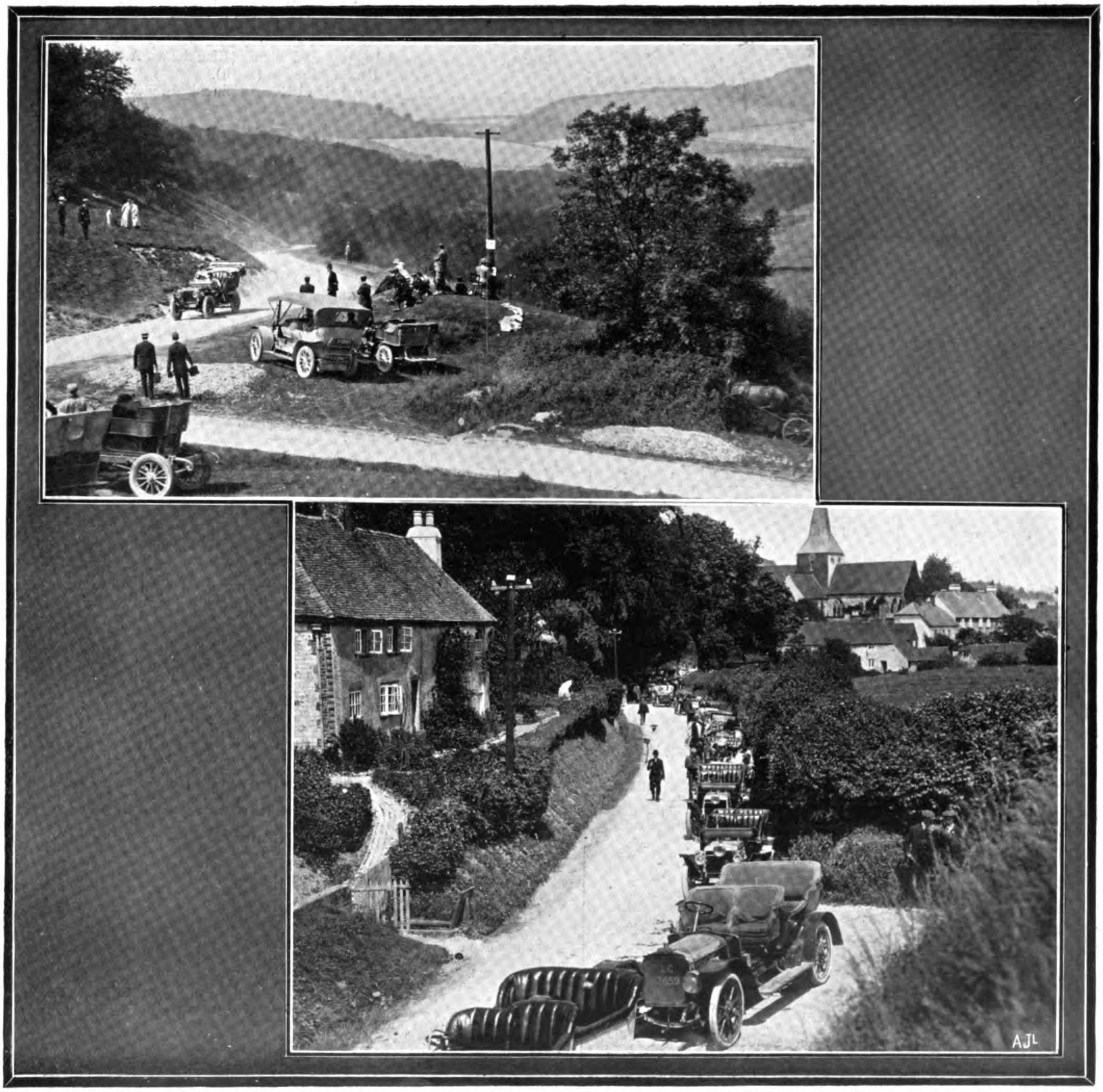

SOUTH HARTING HILL CLIMB.—General views of this important meeting last Saturday. The whole course is seen from the top of the hill in the upper picture, Mr. Philip Williams on his 28-h.p. Daimler, travelling up the hill. In the lower view the cars are seen in line waiting their call, at the picturesque village of South Harting.

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DIARY OF FORTHCOMING EVENTS.

British Events.

June 30 ...	Aston Clinton Open Hill Climb (Herts County A.C.).
June 30 ...	Club Hill Climb (Southern (M.C.).
June 30 ...	Ranelagh Automobile Gymkhana (Ladies' A.C.).
June 30 ...	Speed Judging Competition at Grimsthorpe (Lincolnshire A.C.).
June 30 ...	Speed Judging Trials (Essex County A.C.).
July ...	Motor Yacht Club Reliability Trials.
July 2 ...	Hill Climb (Wolverhampton A.C.).
July 5 ...	Gymkhana at Wadslay Bridge (Sheffield A.C.).
July 7 ...	100 Miles Reliability Trial (North Herts A.C.).
July 7 ...	Hill Climb (Nottingham A.C.).
July 7 ...	Southern M.C. Gymkhana.
July 7 ...	West Essex A.C. Penalty Run.
July 12 ...	Cawkwell Hill Climb (Lincolnshire A.C.).
July 14 ...	Derby A.C. Gymkhana at Burton-on-Trent.
July 14 ...	Essex M.C. Open Race Meeting at Canning Town.
July 14 ...	"Henry Edmunds" Hill Climb.
July 14 ...	Run for Crippled Children (Sheffield A.C.).
July 14 ...	Speed Judging and Picnic (Blackheath A.C.).
July 21 ...	Motor Union Meeting (Bath).
July 21 ...	Mablethorpe Sand Races (Lincolnshire A.C.).
July 28 ...	Hill Climb (Derby A.C.).
Aug. 6–18 ...	Motor Boat Cowes and Ryde Meetings (B.M.B.C.).
Aug. 8 ...	International Cup (Motor Boats) Eliminating Race.
Aug. 9 ...	International Cup (Motor Boat) Race at Ryde.
Sept. 22 ...	Motor Union Meeting (York).
Sept. 27 ...	*Tourist Trophy Race (Isle of Man).

Foreign Events (Trials, Races, &c.).

July 8 ...	Motor Bicycle International Cup Race (Austria).
July 14–17 ...	Ostende Meeting.
July 15 ...	Mont Cenis Climb (Turin A.C.).
July 26–Aug. 15	Circuit Européen.
Aug. 13 ...	Ardennes Circuit.
Aug. 18 ...	Coupe de Liedekerke (Belgium A.C.).
Aug. 26–Sept. 2	Brescia Week (Italian A.C.).

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* Automobile Club of Great Britain and Ireland Events and Papers.

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PASSING EVENTS.

The Archway Smash.

Everyone will experience the profoundest sympathy for the victims of the terrible tramway smash which took place on Saturday afternoon last, near the "Archway Tavern." Though the casualty is a serious one, it was almost a marvel that it was not more serious still. It is too soon, of course, to dogmatise as to what the actual causes of the accident may have been, but there can scarcely be a doubt that the brakes were more or less directly responsible. On the automobile, and on the motor 'bus, ineffective brakes are not unknown, though it must be admitted, in justice to automobile engineers, that it is an occurrence quite remarkable for its rarity. When a tramcar, whose weight is hugely greater than that of a motor 'bus, is once launched on a downhill career, and cannot be brought to rest by its brakes, it goes on till something stops it. Under similar circumstances, a motor vehicle, if driven by a driver with presence of mind, could be turned into a wall or hedge, at a suitable point, and serious injury to its passengers or the public avoided. It is otherwise with the tramcar, which is compelled to keep to its rails unless it shoots off them at a corner, and is unsteerable. This enormous difference in point of the probabilities of disaster attending the failure of brakes of the two types of vehicle should be noted, as it has not always been borne in mind, in estimating the relative safety of the two methods of conveyance.

◆ ◆ ◆

The Scottish Automobile Club Takes Separate Action.

Up till recently, the Scottish Automobile Club were entitled to look for support to the Motor Union in resisting legal action and testing points of law. By a new minute of agreement, however, the Scottish Automobile Club has arranged to act in entire independence in all legal cases, and one of the very first points it is about to test is the power of police magistrates in Courts of Summary Jurisdiction to try cases involving offences against the motor car laws. There is a prevailing opinion in Scotland that only the Sheriff's Court is competent to try such cases, and the Crown authorities are understood to have advised that, in all cases under the Motor Car Acts, prosecution should be taken before the Sheriff. The Scottish Automobile Club is taking legal opinions, and intends to bring the question before the Supreme Court, so as to obtain a final decision.

◆ ◆ ◆

The Truth Department of the Motor Union.

The innumerable directions in which the Motor Union is watchful and active in assisting and benefiting the automobile cause are so numerous that the general public, and even the automobile public, is hardly able to keep them all effectively in mind, and it is really a public service to direct attention to them from time to time. Not the least injurious of the many ways in which the automobile movement has been attacked, is by consistent and persistent misrepresentation—mainly in the past—in the daily Press. It is, of course, well known that if an accident takes place while a motor car is visible within the horizon, the motor car is at once put down as the cause of it. But for the Motor Union too many of these monstrous mis-statements would not only gain credence but remain uncontradicted. "Give a lie a good start," as the cynic observed, "and it is almost impossible for contradiction ever to catch it up." The Motor Union has, however, during the past summer effectively exposed a number of instances of this kind, last and not least being a case from the northern part of the country in which a cyclist had been killed by collision with a runaway horse, and several of the local newspapers attributed the accident to a motor car which was alleged in the first instance to have frightened the horse. Even this indirect connection with the accident, however, was proved by investigation to have been quite devoid of foundation. Prompt action in all cases of this kind has had an undoubted effect on the general Press, and it must be admitted that they are much more discriminating in these matters now than they used to be, and that exaggeration and misrepresentation are vastly less rampant. For this we have unquestionably very largely to thank the activity of the Motor Union referred to above. A couple of years ago we should probably have seen the disastrous tram accident at Highgate (the roll of killed and wounded due to which resembles one of the casualty lists in the late war) ascribed to a motor 'bus, as a vehicle of that description was run into by the uncontrollable tramcar.

◆ ◆ ◆

Consideration for the Public.

While energetic in the cause of the automobile, the Union is not forgetful of the equally important need that exists for discountenancing everything which is liable to create prejudice against motor cars on the part of the general public. From this point of view the Union has determined to do all in its power to suppress the use of exhaust box cut-outs and the employment of exhaust pipes pointed vertically downwards. The awful noise emitted by the former devices, and the amount of dust raised by the latter, unquestionably irritate the public more than any other arrangements that automobiles can be provided with, and the Union has undoubtedly acted with good sense and commendable initiative in circularising manufacturers, who necessarily have a considerable amount of influence with their clients, and secretaries of automobile clubs, requesting them to do all that they can to discourage the employment of these highly objectionable devices.

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Police Appeals: Who Pays?

An indication of the character of the official police mind, if it is permissible to speak of such an abstraction, is afforded by the remarkable circumstance that the police have determined to appeal from the decision of the Croydon magistrates given in the case of Mr. Little. Mr. Little, it will be remembered, is the Croydon gentleman who, though not a motorist himself, or even a scout, was so annoyed with the police proceedings that he gave warning to approaching automobilists of the near neighbourhood of a police motor trap. The police summoned him for obstructing them "in the execution of their *duty*," and the Croydon magistrates, before whom the case was heard, dismissed it. Counsel of such magnitude as Mr. Danckwerts, K.C., and Mr. Bodkin, have been retained for the police, and the Motor Union, who are backing up Mr. Little, have retained the services of Mr. Avory, K.C., and Mr. Hemmerde. It is needless to point out that the services of Mr. Danckwerts and Mr. Bodkin are highly expensive luxuries, and they are luxuries for which, of course, the public will be called upon to pay, with a view of obtaining a decision from the High Courts to enable the police to still further limit the independent action of the public who, after all, are their paymasters and employers. We raise with all diffidence, but still we raise the question with a very strong note of interrogation, as to whether there is any provision in the constitution, or any legal power whatever, to enable the police to act virtually as a corporation, and to use the funds at their disposal in expensive litigation and for briefing counsel in a case of this kind. Whatever happens, we think the matter might very well be brought up by the Motor Union, either in Parliament, or when the next Budget including the vote for expenses of police administration comes up for discussion.

◆ ◆ ◆

The Development of London Traffic.

Very marked interest attaches to the evidence given before Mr. Norman's House of Commons Committee on London Traffic, by Mr. Basson, Chief Inspector of the Carriage Department of the Metropolitan Police. The greater part of his evidence referred to requirements which the police considered necessary as those which should be fulfilled by a motor cab suitable for the Metropolis. Chief amongst these comes the ability to turn round in a circle of 25 feet diameter, while as regards taxameters, which Mr. Basson evidently approves of in principle, he gave the rather surprising impression that he did not believe in the reliability of the existing instruments, and that he had known taxameters doctored by putting a wheel in its wrong place, so as to record double the distance traversed. Mr. Basson's general attitude is so open-minded and so fair that we feel at liberty to comment on his evidence with perfect impartiality, so we would say at once that, while generally in favour of the requirement that cabs should be turned round in the radius he mentions owing to the frequent, one might almost say the general, narrowness of London streets, it would seem that the requirements ought not to be too rigidly insisted upon, as it would to a large extent have the effect of admitting certain builds of cabs to our streets and excluding others, not markedly inferior in general utility, which are not quite able to perform this test. Perhaps the fairest course would be to give a slightly wider limit at present, and indicate the 25 feet as the ideal standard which all cabs will presently be compelled to conform to. As regards the objection to the taxameter, we have been in favour of its introduction all along. Its introduction on motor cabs is particularly called for, owing to the extreme difficulty that ordinary people would have in estimating the distance traversed, and, as regards "faking" them in the manner Mr. Basson suggests, well, every machine can be put out of order if it can be got at, and in Berlin at any rate the machines are so thoroughly armour-plated that, we believe, they are almost as incorruptible as the celebrated Robespierre pretended to be.

* * * *

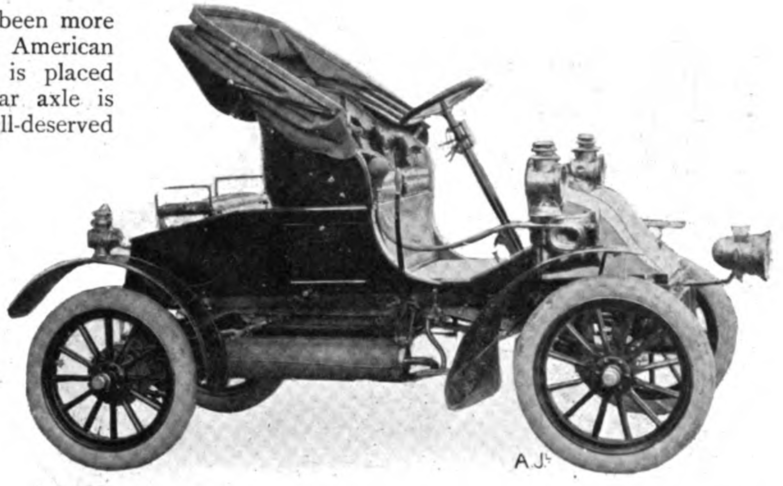
The Edgware Road Accident.

The inhabitants of the neighbourhood of Edgware Road are very wroth with the motor-'bus, and the anger of one of them, at any rate, found caustic vent during the inquest on William Tongue, a painter, who was recently killed by falling from the top of a "Vanguard." Councillor Knight, of the Marylebone Borough Council, declared that :—

> If you had a jury of Edgware Road tradesmen, nothing less than a verdict of "Manslaughter" against the secretary of the company, the driver and the conductor would be returned.
>
> These motor-'buses race, they smell, they knock down lamp-posts and do not pay for them, and they are a perfect nuisance. Only a few days ago they smashed up a cab. They are a danger to the community.

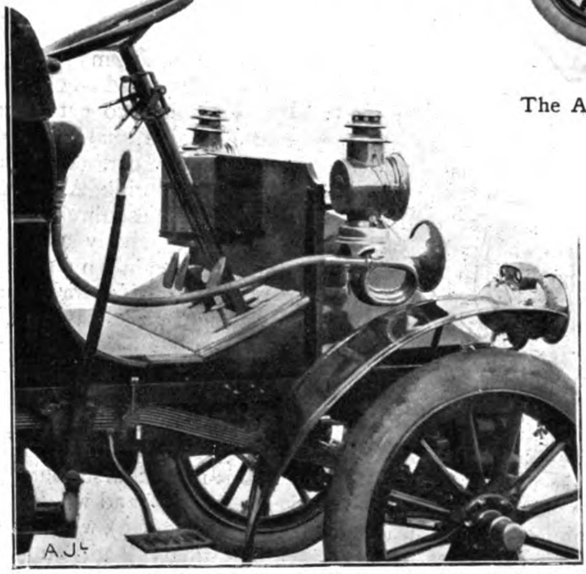
SOUTH HARTING HILL CLIMB.—The busy scene at the village of South Harting at the foot of the hill, where the cars were massed in line to wait their call to the starting line.

THE ADAMS-HEWITT CAR.—PART I.



The Adams-Hewitt Car.—View of the car, showing the bonnet-shaped tool-box.

No kind of light, low-priced automobile has been more universally popular than has that typically American pattern in which a single-cylinder engine is placed horizontally beneath the seat, and the rear axle is driven by one chain. It has obtained a well-deserved popularity, too, for it has, perhaps, the most efficient and simple form of transmission which can be adopted; and efficiency and simplicity are essentially attributes which must be placed before all other considerations in the construction of a car which is to satisfy the man of very moderate means. Hitherto little attempt has been made to manufacture this type of car on a large scale in England, and the progress of the Adams-Hewitt Company, who have erected works at Bedford for this purpose, will, therefore, be watched with all the greater interest. It is a little more than twelve months ago that the first of these cars was exhibited here, but since then many radical alterations have taken place in the design as the result of practical experience, and the Company have now commenced to manufacture a standard model in quantity.



The Adams-Hewitt Car. — View of the dashboard, showing the controlling levers beneath the steering-wheel, and the three pedals for changing speed. At the side, is the brake lever.

Although based on typical American practice, the Adams-Hewitt car is remarkable for its originality of detail. There is hardly a point in the whole design which does not give evidence of having been, as it were, re-thought out, the result of this careful consideration being that the chassis presents many features of unusual interest.

Simplicity of control has naturally been a leading factor, and perhaps the most striking characteristic of the car is that speed-changing is performed entirely by pedals—the only hand-levers being those for manipulating the throttle and ignition, and for operating the brakes. Accessibility has also been studied to a very great extent, and not the least important among the items in this connection is that the body is hinged and can be lifted quite clear of the machinery, as is well illustrated in Fig. 1.

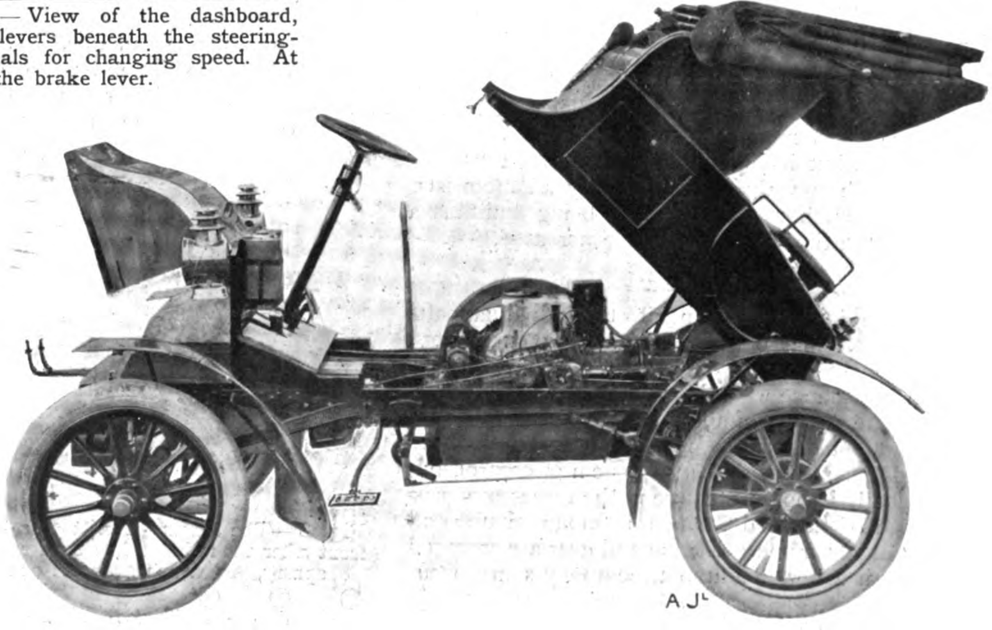


Fig. 1.—The Adams-Hewitt Car.—Side view showing the chassis with the body hinged up. This view gives a good idea of the accessibility of the mechanism on these little vehicles.

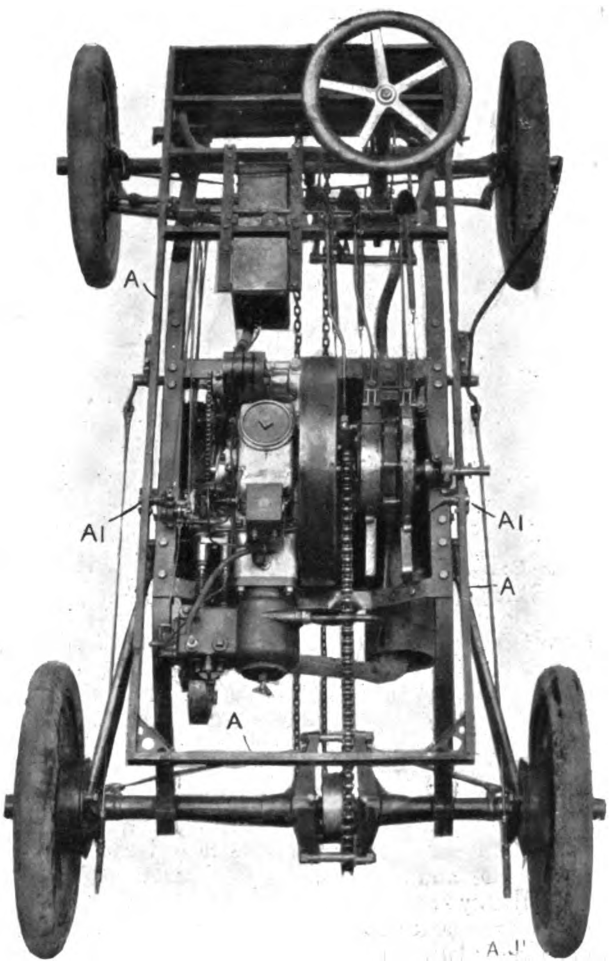


Fig. 2.—The Adams-Hewitt Car.—View of the chassis from above, showing the general arrangement of the machinery, and of the separate body frame, A, which is supported on trunnions, A^1.

The standard model has a comfortable two-seated body, which is also provided with a small spider seat behind. This latter is not, of course, intended as a permanent third seat, but its well known utility on a "two-seater" will be thoroughly appreciated by all motorists. In addition, however, it is also being built as a four-seater, the wheel-base being increased.

Special Mechanical Features.

Before dealing in detail with the individual parts of the car, it may be more interesting to our readers, especially to those who have already had some practical acquaintance with this type of vehicle, if we recapitulate the more important novelties which have been adopted by the manufacturers. We have already referred to the pedal system of control, but an equally important feature is the three-point suspension of the body, which is mounted upon an independent frame. Engine and gear are arranged in the usual way, but both embody some peculiarities in detail. The gear is of the epicyclic type, but has no internally toothed wheels. It is also detachable as a complete unit, without disturbing the engine, owing to the fact that the crank-shaft and the gear-shaft are divided. Low-tension magneto ignition is provided, if required, and one of the neatest fittings on the chassis is the oil pump, which delivers lubricant under pressure to each of the bearings. The carburettor is another original piece of design.

The Frame and Suspension.

The side members of the main frame each form part of the long side-springs, and they are rigidly connected together by a rectangular angle-iron frame, A, which is bolted to them, and is used for supporting the machinery. At either end, the lateral rigidity of the springs is obtained by the axles themselves, for the springs rest in sockets which are rigidly attached to them. An independent frame, A^2, is provided for supporting the body, and this is formed by a light rectangular construction of channel-section iron. It is mounted on the main frame by a pair of trunnions, A^1, which are attached as close to the axis of the crank-shaft as it is possible to get them, in order that the vibrations of the engine shall have as little effect as possible on the body of the car. In front, this frame is supported by a transverse spring, A^3, which rests on brackets fixed to the axle, and these three points form the only connection between the body and the chassis. In order to still further deaden any shocks before they reach the occupants of the car, the transverse spring in front is free to move slightly sideways in the brackets which support it, this motion being only checked by small helical springs, A^4, arranged in a manner which is clearly indicated in Fig. 3.

In front, the axle is a straight tube, and it is stayed in the middle by a tie-rod which passes beneath it. The rear axle casing is also tubular, but is, of course, built up to suit the single chain drive. All the road wheels are mounted on conical roller-bearings (Timken), which take the end thrust as well as the ordinary load, and are adjustable. The steering is designed on the ordinary Ackermann principle, and the steering-gear, which is operated by a hand-wheel, consists of a simple rack and pinion. Forked radius-rods are provided to tie the rear-axle to the frame; they are clearly illustrated in Fig. 2.

(*To be continued.*)

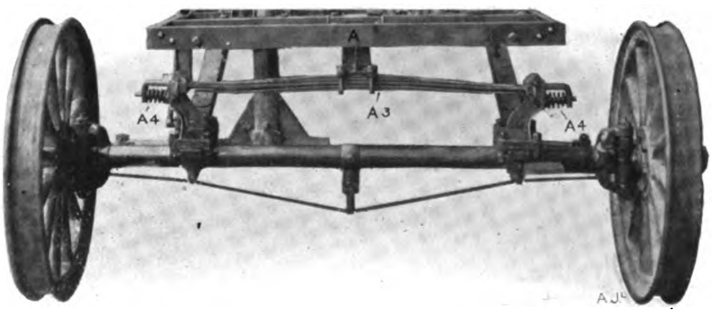


Fig. 3.—The Adams-Hewitt Car.—View of the chassis from in front after the radiator has been removed, showing the transverse spring, A^3, which supports one end of the body frame, A.

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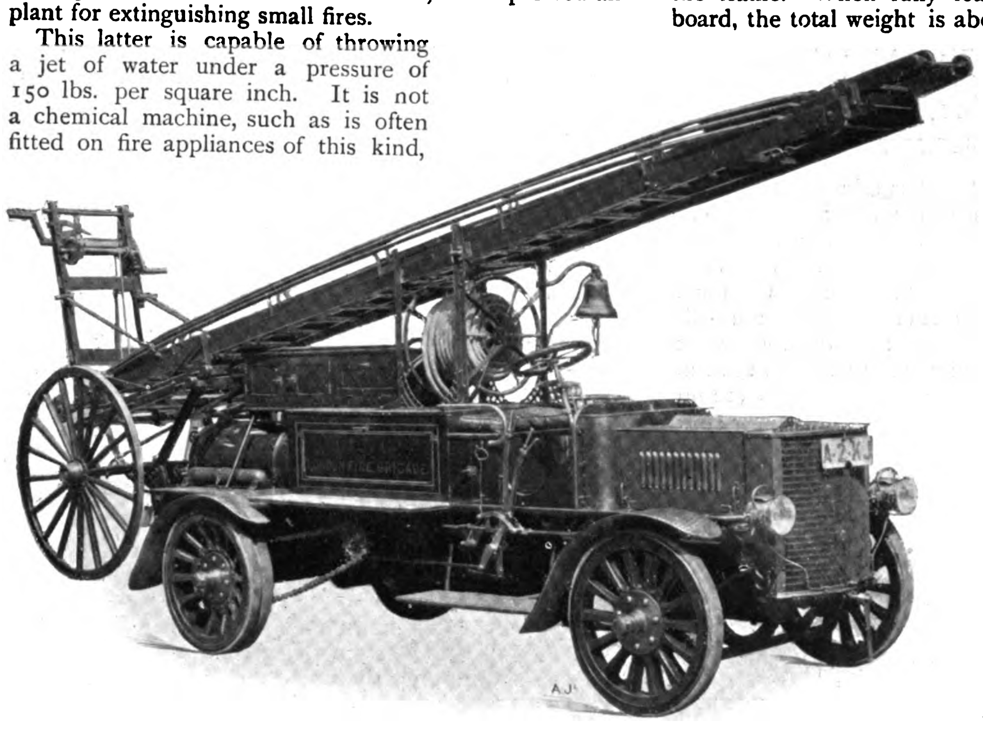
The Automobile Ousts the Yacht.

THE rival attractions of the motor car have been working havoc with the membership of the Royal London Yacht Club, which dates back to 1834, and at one time had close on a thousand members. In consequence of its diminished membership, the Club has had to give up its quarters at No. 2, Savile Row, and make its London home at the Blenheim Club. The Club intends, however, still to keep up its Cowes house.

THE L.C.C. MOTOR FIRE ESCAPE.

The London County Council Fire Brigade, which has seldom been accused of any undue desire to be premature in the acquisition of the latest fire appliances, is to be congratulated on the purchase of their first large petrol-driven machine. It is not, as our illustration shows, a fire engine, but is one of those particularly useful first aid appliances, which can do so much towards the saving of life and property before a fire has fairly got hold of the premises. This machine has been constructed by Merryweather and Sons to meet the requirements of Capt. Hamilton, R.N., chief officer of the brigade, and is of a somewhat novel type. It carries a "sliding carriage" fire escape, capable of reaching to the height of 55 ft. when fully extended, and it has, in addition to the regulation boxes of tools and hose, a compressed air plant for extinguishing small fires.

This latter is capable of throwing a jet of water under a pressure of 150 lbs. per square inch. It is not a chemical machine, such as is often fitted on fire appliances of this kind, but simply consists of a cylindrical water drum of 60 gallons capacity, which can be coupled up to a steel cylinder containing air compressed to about 2,000 lbs. per square inch. There is a compressed air cylinder on each side of the water drum, each cylinder being approximately capable of discharging the drum twice, and the drum can, of course, be replenished very quickly from the nearest hydrant. The fire-escape itself is mounted so that it can be very rapidly unshipped, and even the operation of replacing it on the chassis only occupies about thirty seconds.



NEW MOTOR FIRE ESCAPE FOR THE L.C.C.—This machine is fitted with a 50-h.p. petrol engine, and carries in addition to spare hose and tools, a 55 ft. escape, and a "first-aid" extinguishing plant operated by compressed air.

The engine has been specially designed by Merryweather and Sons, and is capable of developing 50 h.p. It is fitted with both magneto and battery ignition, and, although both systems are used in conjunction with the same ignition plugs, yet each has its own set of wires. An ordinary leather cone clutch is employed between the engine and the gear-box, which latter provides three forward speeds and a reverse. The rear wheels are driven by side chains, and the machine is geared to twenty miles per hour at normal engine speed. A very distinctive feature is the large curved radiator in front of the bonnet. This is so constructed that, should either of the first two rows of tubes become damaged, the remaining tubes can still be used. A large water tank is also provided, and is placed in such a position that natural circulation can take place in the event of the circulating pump breaking down.

Ordinary semi-elliptic springs have been used for the suspension of the chassis, but it is interesting to note that shackles have been abandoned in favour of sliding guide-blocks for attaching the ends of the rear springs to the frame. When fully loaded, and with the men on board, the total weight is about 4 tons 15 cwt. It has a wheel base of 11 ft. 6 in., and measures over all 21 ft. Even so, however, it is considerably shorter than the overall length of any similar horse-vehicle, and therefore occupies less space on the road.

In a trial run last week in hilly Kent, over a distance of about 50 miles, the results were highly satisfactory, a speed of 31 miles per hour being maintained when necessary on the up-grade.

* * * *

The Lunatic in the Car.

A lunatic in a motor car is a pretty dangerous sort of phenomenon, and it is fortunate that the escapade of Mr. H. C. Orrendorf, a wealthy New Yorker, who has been for some time in a private lunatic asylum, where he was undergoing treatment, was not productive of some serious accidents. He escaped from the private asylum recently, took possession of his 50-h.p. 6-cylinder Thomas car, and after a two days' tour round the country, took to racing up and down the streets of the town of South Norwalk. Finally he knocked a man off a tramcar, and was taken possession of, and presumably brought back to undergo further "treatment" by the police.

An Unseasonable Outburst.

If anybody indulges in lachrymosity at a wedding it is, for some unknown reason, usually the bride or the bride's mother (not infrequently both), but at a recent celebration of this kind at Norwich, when the "happy" couple were leaving in an automobile—the now customary method of commencing a honeymoon—one of the tyres of their car burst into tears—not many, but sufficient to cause the departure to be postponed.

MAKING A PISTON-RING.

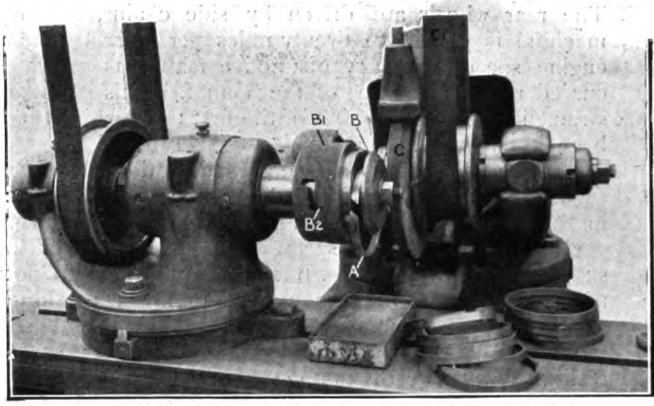


Fig. 1.—Grinding a Piston-Ring. View of the machine used in the Napier works for grinding the outer surface of a piston-ring. In this illustration a piston-ring, A, is shown between the faces of the chuck, B, by which it is held, but before it has been properly fixed in position.

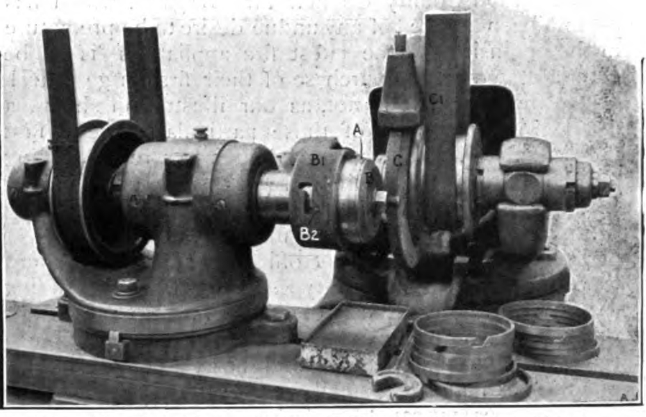


Fig. 2.—Grinding a Piston-Ring. View showing the piston-ring, A, properly fixed in position and ready to be ground. It is centered by the aid of the sleeve, B^1, which can be drawn over the chuck for this purpose. Only the outer surface is finished in this machine.

Some little time ago, in The Automotor Journal of March 31st, we gave an illustration and a description of the apparatus employed in the Napier works for grinding the cylinders of their engines true to size. Now we are able to supplement that example of refined motor car construction by another which is equally interesting and is also equally characteristic of the care and attention which high-class firms like the Napier give to the manufacture of even minor parts. Our illustrations represent the processes by which piston-rings for Napier engines are finished. In the rough a number of them together constitute a cylindrical casting, and the first processes consist of machining off the rough faces inside and outside, and of cutting up the cylinder into short lengths, each of which forms a ring of approximately the size required. Each of these rings is then split obliquely, and is placed in a special machine in order to be "drawn." This process consists of striking the inner face of the ring with a special tool, which has the result of elongating that surface, thus causing the split ring to have a natural tendency to spring open. It is in order that the rings may be a true fit in their working positions, that so much trouble is taken by firms like the Napier, with whom these matters are part and parcel of their reputation. Usually, where cost of production is allowed to be a prime factor in determining the method to be adopted, embryo rings are turned up, split, and finished off to suit the bore of the cylinder, without any further special treatment. The necessary springiness is obtained by originally turning the rings to a larger diameter and springing them to a smaller diameter after they have been split. They are, of course, finished off after this process so that they are an exact fit.

After the rings have been machined to their approximate dimensions, they are placed in the grinding machine, which is illustrated in Figs. 1 and 2, where they are finished off to their exact size. In Fig. 1 a piston-ring, A, is shown loosely placed in a chuck, B, by which it is held when being ground, but in Fig. 2 the ring is shown properly fixed in position and ready for

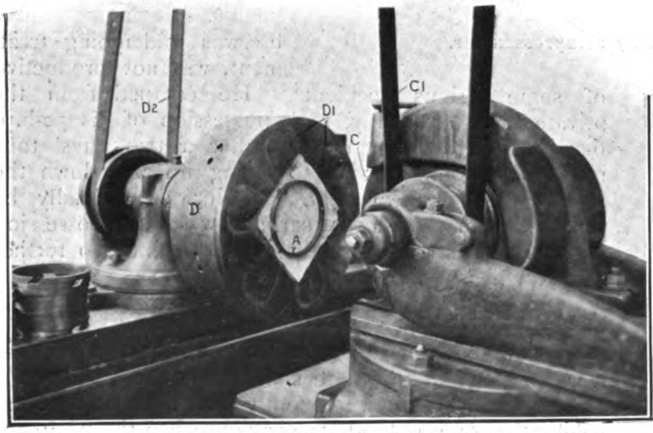


Fig. 3.—Grinding a Piston-Ring. View of the machine used in the Napier works for grinding the end faces of piston-rings. In this illustration a piston-ring, A, is shown in place on the magnetic chuck, D, and a piece of paper has been placed behind the piston-ring in order to more clearly show that there is no mechanical fixing.

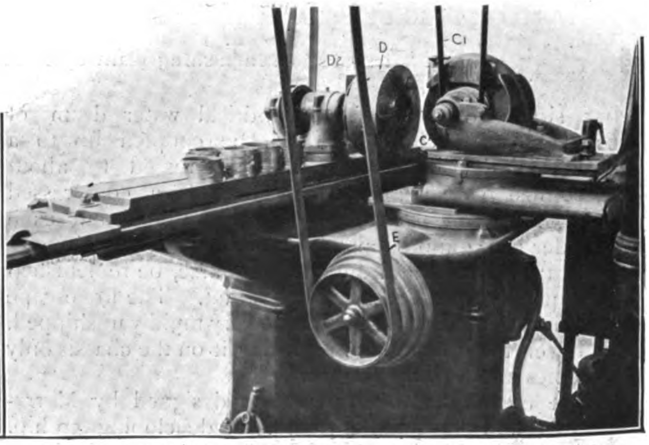
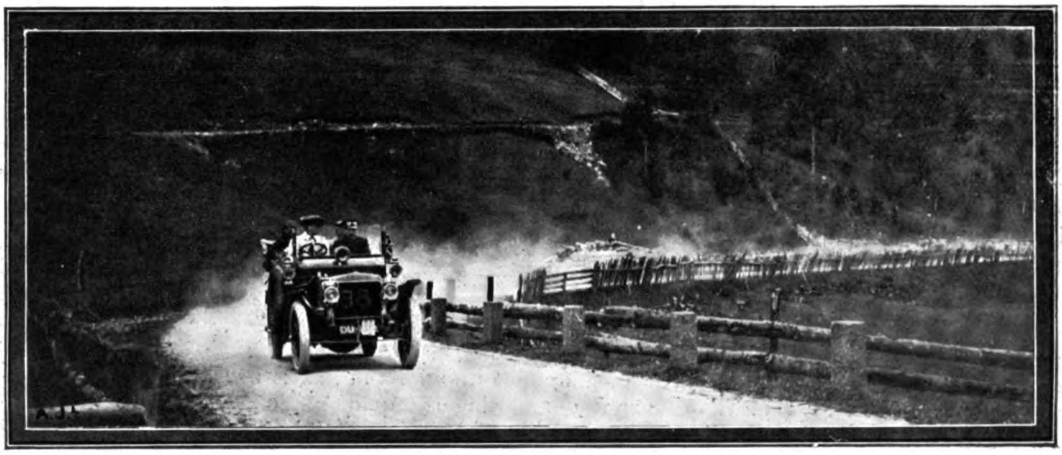


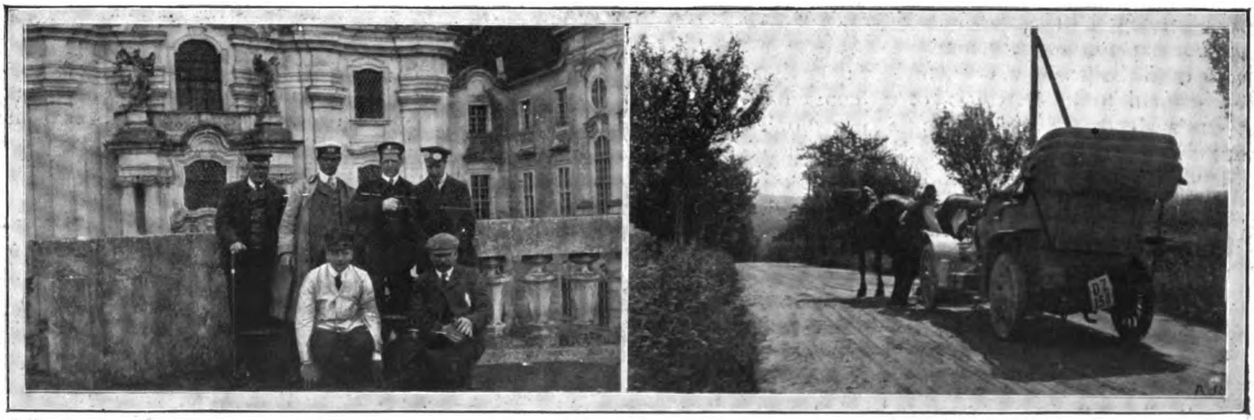
Fig. 4.—Grinding a Piston-Ring. Another view of the grinding machine illustrated in Fig. 3, but showing the complete apparatus and the various driving belts. The chuck is rotated at high speed as well as the emery wheel, and another belt, E, causes the emery wheel to come into contact with the entire surface.



HERKOMER TROPHY.—Mrs. Manville who drove so splendidly throughout the contest, coming over the crest of the famous Brenner Pass on her 35-h.p. Daimler.

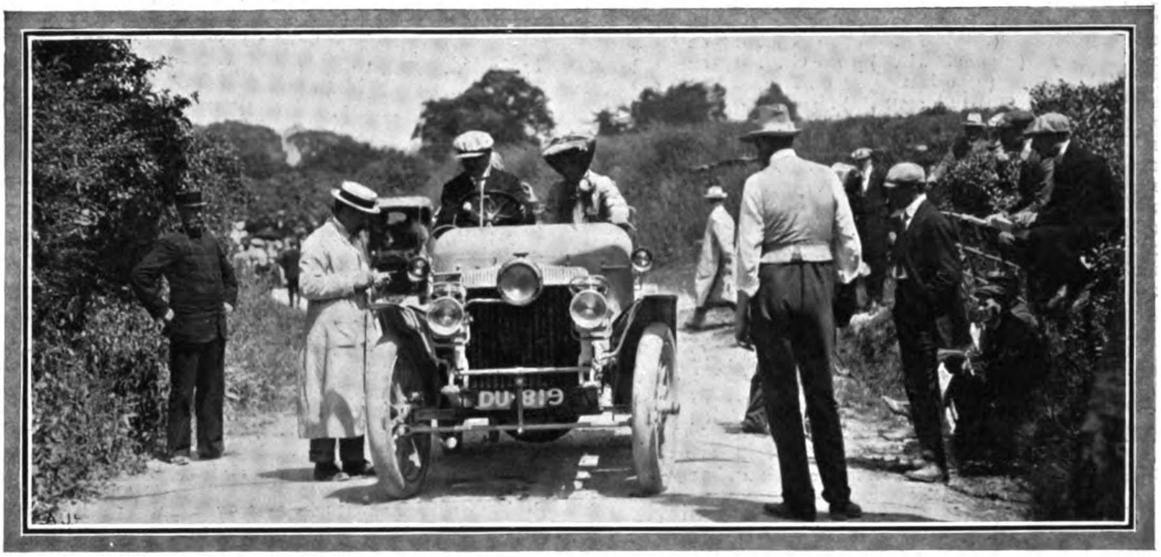
the actual grinding process to commence. It is, of course, of the utmost importance that the ring should be mounted absolutely accurately in the chuck, and for this purpose there is a special gauge, B¹, forming part of the grinding machine, which renders a mistake in adjustment impossible. This gauge is very prominent in our illustration, and consists, it will be noticed, of a sleeve placed concentrically with the chuck. By loosening the small set-screw, B², the sleeve can be drawn over the chuck, and when fixing the piston-rings in place, they are first mounted in the gauge in order to centre them. When the chuck-plate, B, has been fastened in place, however, the gauge is withdrawn, but the piston-ring remains in its correct position for grinding. This process takes off $\frac{1}{100}$th of an inch from the outer surface of the ring.

The inner surface is not touched by a machine after it has passed through the "drawing" tool, but the two side-faces of the ring are ground up to size on another very special machine which we illustrate in Figs. 3 and 4. It will, of course, be obvious that it would be extremely difficult to hold such a very narrow ring as a piston-ring by mechanical means, and yet to leave one of its faces free to be operated upon. In the Napier works, however, this difficulty is ingeniously overcome by the use of an electro-magnetic chuck. This chuck, D, forms a powerful magnet when an electric current is passed through the six curiously-shaped coils, D¹, that are embedded in its interior. The magnetism thus induced is sufficient to hold a piston-ring firmly against the face of the chuck without any supplementary mechanical means whatever. In Fig. 3 a piston-ring is thus shown supported on the chuck, and a piece of paper has been placed behind it in order to more clearly emphasise the absence of any mechanical fastening. In Fig. 4 a more comprehensive view is given of the complete grinding machine in order to show the various belts by which the different members are driven. In grinding, it is usual for both the grinding-wheel and the object itself to be rotated, and in Fig. 4 the belt, C¹, is operating upon the pulley of the grinding-wheel, while the belt, D², drives the magnetic chuck that carries the piston-ring. The other belt, E, in the foreground of the illustration, is for the purpose of operating a mechanism which causes the work that is being ground to move to and fro across the face of the grinding-wheel, the width of the grinding-wheel being, of course, considerably less than the total width of the finished surface.



HERKOMER TROPHY.—An interesting group of some of the British party on the Royal Castle walls at Melck, who took part in the contest, is seen in our left photo. Those in the photograph, reading from left to right are Lord Frederick Hamilton, Mr. Philip Dawson, Mr. Percy Martin, Mr. H. Massac Buist, and Mr. Albert H. Bush, who was the special tuner-up of all the Daimler cars. In the right-hand picture one of the foreign cars is being towed up hill after having broken its first speed gear. The snapshots are by Captain David Hughes Morgan, taken on the road from Linz to Vienna.

RACES, RECORDS, AND TRIALS.


SOUTH HARTING HILL CLIMB.—Mr. Edward Manville on his 35-h.p. Daimler Car at the starting point. Mr. Manville made the best time of the competing cars at the meeting.

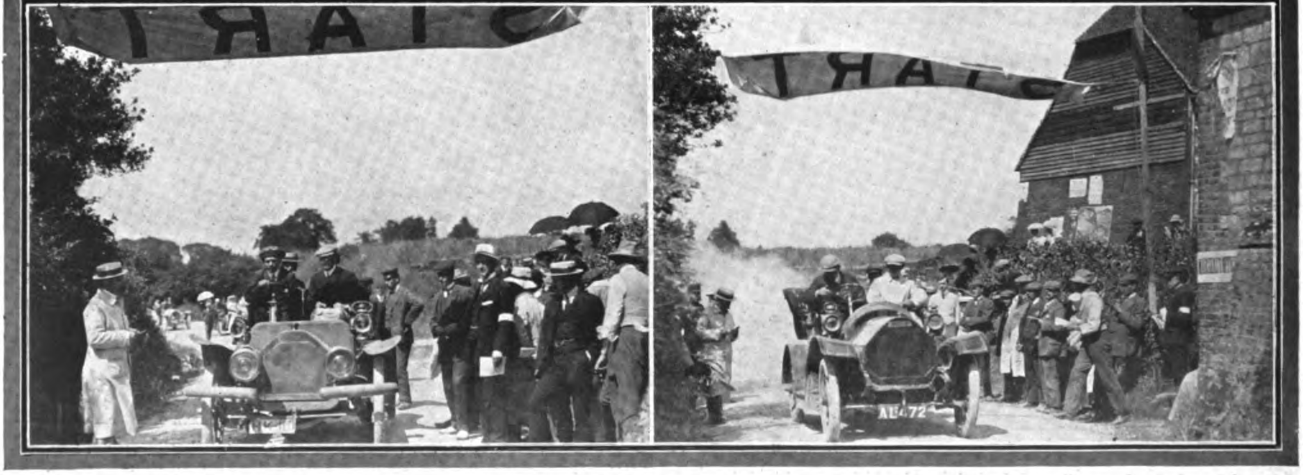
SOUTH HARTING HILL CLIMB.

THE Portsmouth Road was never so well patrolled for police traps as it was from last Friday noon until the small hours of Saturday morning. Motor cars *en route* to Petersfield for the South Harting Hill Climb were the primary cause of this unusual vigilance. A new definition of the phrase "rubber-necking" was discovered, as it applied to the occupants of cars who, by trying to watch the road "both ways at once," acquired a cervical flexibility which seriously interfered with the harvest of gold which otherwise would have been reaped by local exchequers. A few there were, however, who failed to exercise this vigilance and lived to regret it.

Arrived at Petersfield, the problem of the hour was to find a place to sleep. Every room in the hotels had been pre-empted a week or more in advance, and lucky villagers possessing the luxury of a spare room had no difficulty in obtaining Ritz Hotel prices for a night's lodging. And even so there were not a few of the late arrivals who were obliged to make shift with forty winks in a tonneau and a splash under the hose in lieu of bed and bath.

Hours before the time set for the opening of the day's hill climbing the village of South Harting was already astir with motors anxious for a preliminary canter up hill. A few succeeded in making the run, but the officials of the A.C.G.B.I. and the Sussex County A.C. wisely cut short the privilege in order to keep the road in the best possible condition for the competitors. The wisdom of this precaution was apparent later in the day, when the most awkward spot on the up-grade, not inappropriately described as "Chalk Point," presented a rubbly surface, which played the very mischief with speed.

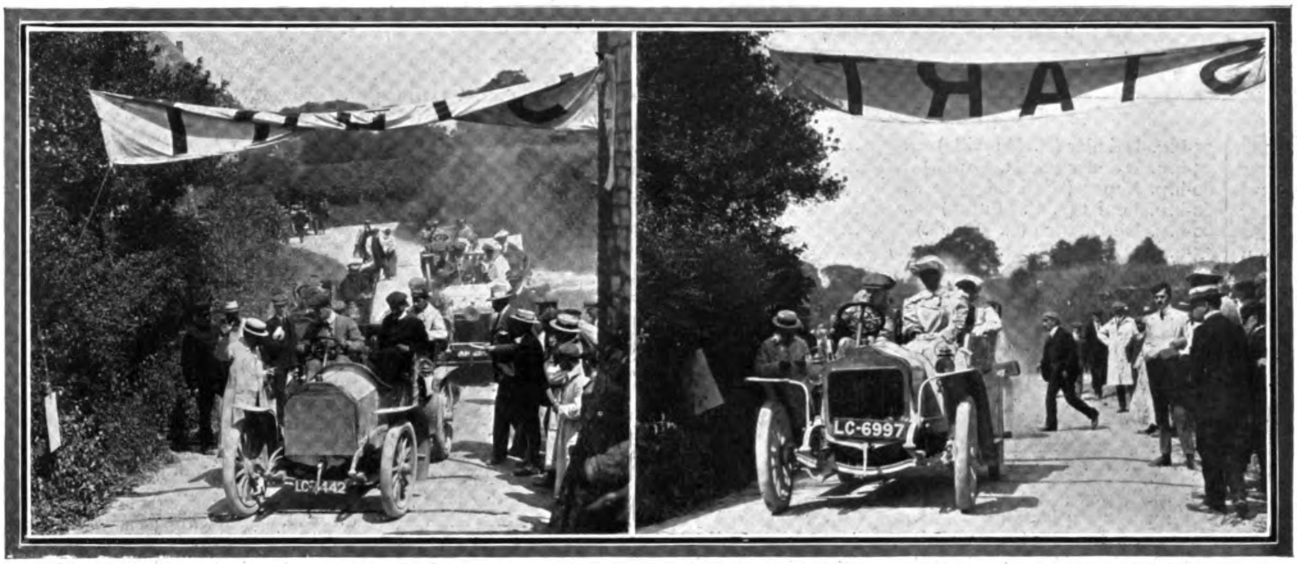
The usual custom of sending smaller cars first, giving them the advantage of the road in best condition as



Mr. G. Hubert Woods at the starting tape on his 26-30-h.p. Simms-Welbeck.

Mr. Thomas Chas. Pullinger gets off well with his 16-20-h.p. Beeston Humber.

SOUTH HARTING HILL CLIMB.



Mr. J. E. Hutton on his new 60-h.p. Berliet Car waiting for the word to go.

Mr. J. T. C. Moore-Brabazon just started on his 22-h.p. Minerva.

SOUTH HARTING HILL CLIMB.

compensation for their lack of power, was reversed on this occasion. Instead, the heavier cars were given first place in line, and precisely at 11 o'clock No. 1, a 60-h.p. Napier, was given the word "Go!"

From the starting point the road is visible only a short distance, being almost immediately hidden by the high banks on each side of the cutting. About two hundred yards further it skirts the side of the hill, giving a momentary glimpse of the speeding car, only to be lost sight of again immediately until it emerges after a wretched upward twist, and continues thence at a grade of 1 in 15 up to the sheer crest of the hill, more than half a mile from the starting point. Then comes a fairly level stretch of a few hundred yards to the finish.

In the first class to compete, Class D, for cars of a chassis price over £850, it was apparent even to the spectators at the foot of the hill that the Daimlers had easily the best of it. This was confirmed when the official list was announced later.

In class B, for cars of a chassis price £500 to £850, there was some disappointment that owing to a slight accident on the way down Mr. F. Coleman's White steam car was not in time to face the starter. Once again the Daimler lived up to its reputation as a hill climber by securing first prize, which fell to Mr. George S. Barwick's 30-h.p. car, second honours being secured by Mr. Frederic W. Bailey's 50-h.p. Napier.

In the next class, B, for cars of a chassis price between £350 and £500, there was a remarkable difference between the performances of the leaders and the tail-enders. The first of the latter category, Spyker No. 57, it is only fair to say, was hampered somewhat by meeting a car going down hill as it was ascending. The delay, however, was not considered of sufficient moment to warrant a protest, as it was found earlier in the day that the Spyker was "a little off" owing to its clutch slipping.

In the last class, A, for cars of a list price from £150 to £350, there were twelve competitors.

Following the close of the regular programme, a sporting match was arranged between Mr. Frederic Coleman's 18-h.p. White steamer and Mr. F. W. Bailey's 50-h.p. Napier (Miss Dorothy Levitt driving the latter). The White steamer made an allowance of 10 secs. to the

Looking towards the starting point. Mr. Warwick J. Wright just getting away on his 20-h.p. Darracq.

Miss Dorothy Levitt travelling well on the 60-h.p. Napier.

SOUTH HARTING HILL CLIMB.

Table in Order of Speed Merit.

	Car and Driver.	Points.
	Class D.	
1st	35-h.p. Daimler (E. Manville)	282·6
2nd	35-h.p. Daimler (G. D. Powell)	276·6
3rd	60-h.p. Napier (Cecil Edge)	275·6
4th	60-h.p. Berliet (J. E. Hutton)	273·8
5th	60-h.p. De Dietrich (C. Bianchi)	273·2
6th	35-h.p. Daimler (E. M. C. Instone)	272·4
7th	35–45-h.p. Daimler (H. Musker)	271·2
8th	35-h.p. Daimler (Allen D. Grigg)	264·8
9th	60-h.p. Napier (S. H. Pearce)	262·8
10th	35–50-h.p. Pipe (Claude Watney)	248·0
11th	30–40-h.p. Peugeot (M. F. Miéville)	244·0
12th	30–40-h.p. Peugeot (Chas. Friswell)	228·8
13th	60-h.p. Napier (Ernest Owers)	226·2
14th	30-h.p. Westinghouse (C. Martin)	198·0
	Class C.	
1st	30-h.p. Daimler (G. S. Barwick)	278·0
2nd	50-h.p. Napier (Miss D. Levitt)	276·2
3rd	40-h.p. Darracq (A. Rawlinson)	273·8
4th	30–40-h.p. Daimler (P. Musker)	267·6
5th	30-h.p. Daimler (J. M. Gorham)	264·6
6th	25–35-h.p. Fraschini (H. E. Hall)	251·4
7th	30-h.p. Daimler (C. Grinham)	250·4
8th	30-h.p. Daimler (A. Hordern)	249·2
9th	30–40-h.p. Daimler (P. Brodtmann)	236·2
10th	28-h.p. Pipe (G. Dumont)	208·2
11th	22-h.p. Berliet (J. E. Hutton)	186·4
12th	24-h.p. Rochet-Schneider (A. Haslop)	177·4
13th	28-h.p. Daimler (P. Wilkins)	173·0
14th	35–40-h.p. Iris (A. C. Earp)	169·4
15th	28–36-h.p. Daimler (G. H. Warne)	166·8
16th	24-h.p. Beaufort (A. E. Oakley)	119·0
—	35-h.p. Rochet-Schneider (R. St. J. Willans)	not placed.
	Class B.	
1st	20-h.p. Darracq (W. J. Wright)	264·0
2nd	20-h.p. Darracq (A. H. Walker)	254·2
3rd	20–32-h.p. Darracq (S. Girling)	231·0
4th	20–32-h.p. Darracq (G. F. Heath)	229·6
5th	20–32-h.p. Darracq (A. L. Guinness)	214·4
6th	12–16-h.p. Talbot (Q. O. Grogan)	212·0
7th	14-h.p. Germain (H. Ramoisy)	200·0
8th	12–16-h.p. Talbot (T. H. Woollen)	197·6
9th	16–20-h.p. B.-Humber (T. C. Pullinger)	195·6
10th	26–30-h.p. Simms-Welbeck (G. H. Woods)	188·2
11th	22-h.p. Minerva (J. T. C. Moore-Brabazon)	187·8
12th	14-h.p. Thornycroft (J. Sharp)	177·6
13th	26–30-h.p. Simms-Welbeck (D. McNeill)	176·0
14th	16–20-h.p. Argyll (W. C. Earp)	167·2
15th	18-h.p. Speedwell (R. Chandler)	161·6
16th	18–22-h.p. Florentia (L. Goldsby)	150·4
17th	14–18-h.p. Spyker (C. Machin)	87·0
18th	22-h.p. Minerva (L. Russell)	84·8
19th	18-h.p. Star (R. A. Cobb)	70·2
20th	25-h.p. M.M.C. (R. P. Gosnell)	41·6
21st	18–22-h.p. Whitlock-Aster (W. H. Arnold)	32·4
22nd	10-h.p. Peugeot (M. F. Miéville)	27·6
	Class A.	
1st	10-h.p. Stanley (Steam) (A. H. Bruck)	188·4
2nd	10–12-h.p. C.-Humber (L. Coatalen)	172·4
3rd	10-h.p. Alldays (E. J. Blakemore)	171·0
4th	10-h.p. Alldays (F. W. Huband)	170·4
5th	16-h.p. Reo (F. G. Sharp)	149·4
6th	8-h.p. James-Browne (C. L. Cattell)	107·6
7th	10–12-h.p. Humber (Mrs. H. Musker)	91·6
8th	10-h.p. Lindsay (F. H. Arnott)	74·0
9th	12–16-h.p. Russell (H. A. Bate)	66·2
10th	10-h.p. Adams-Hewitt (F. L. Martineau)	– 21·4
11th	8-h.p. Crypto (W. G. James)	– 45·8
12th	6-h.p. Peugeot (M. F. Miéville)	–139·8

Napier, the latter car going uphill first. It was a great race, the big Napier coming on to the level at a fine gait. The official time is not given, but it was said to be well under 1½ mins. But, fast as the time was, Mr. Coleman managed to clip off 1⅕ secs. from Miss Levitt's time.

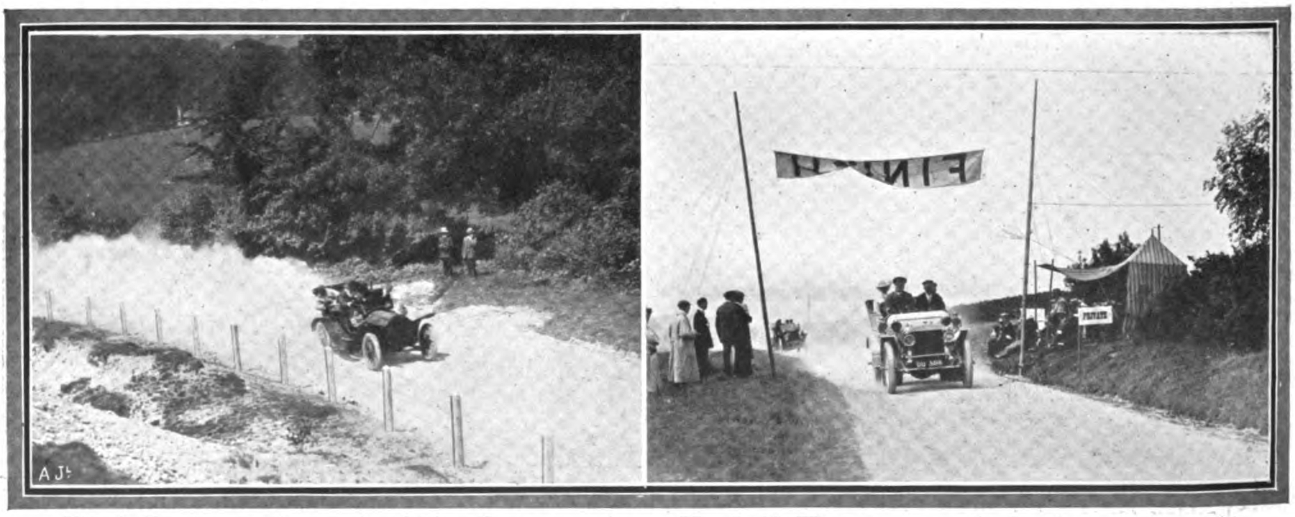
The prizes were distributed at the tent on the hill-top by Lady Russell, after which competitors and officials were entertained at tea by Earl and Lady Russell at Telegraph House.

Circuit Européen.

JUNE, 1907, has been named for the running of this event, which was this year abandoned.

Vanderbilt Cup Race.

IN view of the refusal of the A.C. de France to take part in the race, a possible way out of the difficulty of obtaining entries of French racing cars for the Vanderbilt Cup this year has been arranged by those controlling the running of the Vanderbilt Race. It has been decided that the first five French cars which are classed in the Grand Prix this week, will have the option of representing France in the Vanderbilt Race. In the event of any of the five declining the honour, then up to the number of five the French cars in rotation, as classed, will have the opportunity of filling any remaining places in the French team.



Mr. A. Rawlinson driving his 40-h.p. Darracq at the acute bend up the hill.

Mr. G. H. Warne passing the finishing point on his 28-36-h.p. Daimler.

SOUTH HARTING HILL CLIMB.

SOUTH HARTING HILL CLIMB.—The Clerks of the Course. Colonel H. C. L. Holden, R.A., F.R.S., Mr. Alfred Bird, and Mr. A. Scrase-Dickins are summoned hastily to decide a knotty point.

Aston Hill Climb.

The open hill climb at Aston, near Tring, which is being held for the third year in succession to-day (Saturday) by the Hertfordshire County Automobile Club, promises to be one of the important meetings of the season, amongst the sixty cars entered being several which are likely to make good times on the hill, not forgetting Mr. Frederic Coleman's "White" steam car, and some of the 35-h.p. Daimlers which have given such a good account of themselves recently. Aston Hill is on the road between Tring and Wendover, it being the first turning to the left after reaching the top of the Chiltern Hills before reaching Aston Clinton. Mr. Alfred C. de Rothschild, who always displays a keen interest in this fixture, the road on which the contest takes place dividing his property, very generously entertains the officials and entrants during the day.

The event is a handicap, and a trophy goes to the winner. In addition, a special prize is offered to the car making the fastest time up the hill, whilst Mr. E. T. Pryor has presented a ten-guinea cup, to be known as the Aston Challenge Cup, to the car belonging to a member of the club unconnected with the trade which makes the most meritorious performance up the hill.

The nearest railway station to Aston Hill is Wendover, and motorists travelling down by road are cautioned in regard to police traps from Hendon to Stanmore and from Berkhamsted to Tring, a long-distance trap being in existence at the latter spot. Weighing in takes place at Boxmoor Station (London and North Western Railway), from 11 a.m. to 2 p.m., the first car being sent off up the hill at 3 p.m.

SOUTH HARTING HILL CLIMB.—The Clerks of the Course. The knotty point satisfactorily settled.

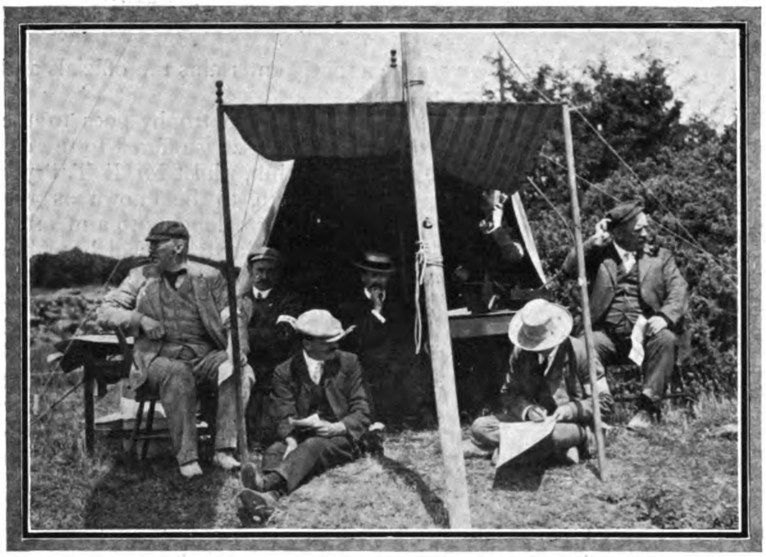
SOUTH HARTING HILL CLIMB.—During the lunch interval in the village.

Grindleford Hill Climb.

In our last issue we referred to this event, which is held annually by the Sheffield and District A.C. on the road which runs through Padley Wood, but were unable to give actual results, as the event is a handicap involving the use of a formula. In Class 1, Mr. A. Farnell, who made the fastest time of 3m. $28\frac{2}{5}$s., with his 30-h.p. Daimler, has also been successful in winning under the handicap, Mr. Benjamin Hinde on a 12-h.p. Talbot being second (5m. $25\frac{2}{5}$s.). In Class 3, Mr. J. H. Hall is placed first with his 20-h.p. Darracq, although his time of 6m. $9\frac{3}{5}$s. is greater than that of Mr. T. Nash, who takes second place with his 18-h.p. Mercedes, on which he made the second fastest time (5m. $14\frac{3}{5}$s.) of the meeting. In the formula the length of the course was taken as being 7,920 feet, and the height of the hill as 460 feet, and the average gradient as being 5·9 per cent.

On the handicap for all cars, the Stanley steam car, in spite of being classed as equivalent to an 8-cylinder petrol engine, comes out the best, the second being the 10-h.p. Alldays car, and the third the 30-h.p. Daimler.

Arrangements are being made for re-holding this competition on July 7th, there being already considerably over fifty entries.



SOUTH HARTING HILL CLIMB.—The judge's and timekeeper's tent at the finishing point. Earl Russell, the judge, is seated outside the tent on the left.

A Scottish Club Officially-Observed Trial.

WE are officially advised that Mr. Frederick Eastmead, of the Sunbeam Motor Company, Limited, has arranged with the Scottish A.C. for the official observation of a Sunbeam car over a long distance trial from John-o'-Groats to Land's End and back, during which the run is to be a non-stop one, except for meals *en route*. Official observers at various points of the run will, in succession, travel with the car.

Lanchester Hill Climb.

THE following are the official results, the classification being in all cases by the cylinder capacity, of the Hill-climbing Competition at Ragpathside on the 16th inst. The event was under the auspices of the North-Eastern Automobile Association:—

Class 2.—Motor Bicycles; only 1 ran. N.S.U.

Class 5.—Capacity not exceeding 2 litres; 7 ran. 1st, 10-h.p. Alldays; 2nd, 10-h.p. Darracq.

Class 7.—Capacity not exceeding 3 litres; 2 ran. 1st, 12-16-h.p. Wilson-Pilcher.

Class 8. Capacity not exceeding 4 litres; 3 ran. 1st, 10-h.p. Stanley steamer.

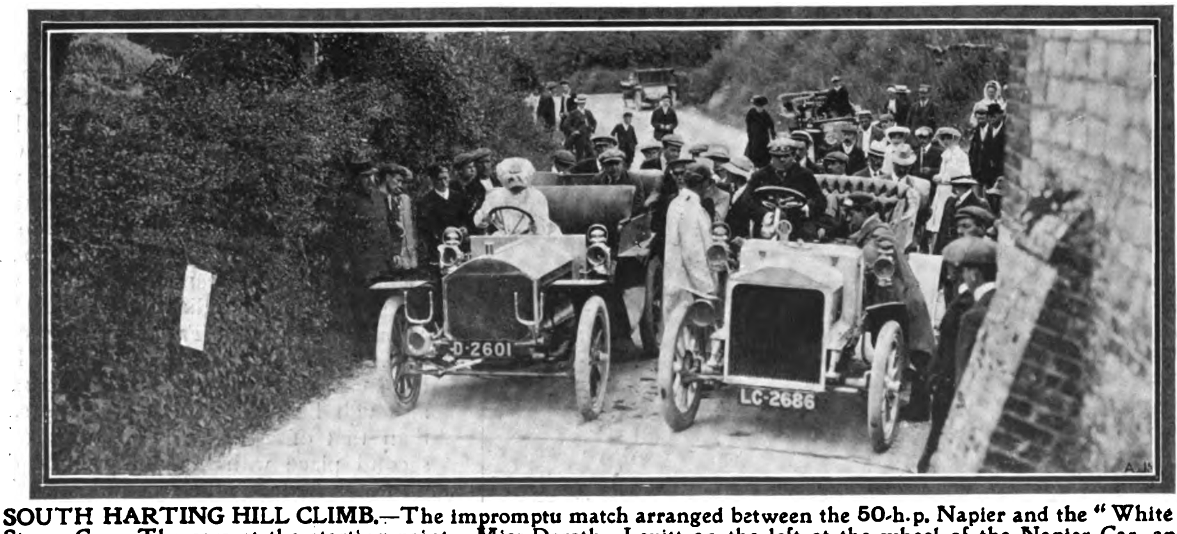
Class 9.—Capacity not exceeding 5 litres; only 1 ran. 18-24-h.p. Wilson-Pilcher.

Class 11.—Capacity *exceeding* 6 litres; 2 ran. 1st, 30-h.p. Daimler.

The fastest time on the hill was made by the 30-h.p. Daimler, which was 17 secs. faster than the 40-h.p. Fiat running in the same class.

Boulogne Motor Meeting.

UNDER the auspices of the A.C. du Nord a motor meeting is being arranged to take place at Boulogne—July 18th to 20th. There will be classes for racers and tourist cars. At this meeting the Gold Medal Challenge Cup of Leopold II, at present held by the President of the A.C. du Nord, will be run for. This was disputed for the first time in 1904 at the Arras meeting, and for the second time last year on the North of France Tourist Circuit. The De Caters Challenge Cup, which was contested in 1904 and 1905 on the Doullens Hill over a distance of 500 metres, flying start, and was secured in the first year by Wagner, on a Darracq, and last year by Hanriot, on a Bayard-Clement, will be also open for competition. At Boulogne the former will be run for on a hill over a distance of one kilom. The programme arranged is, for July 18th and 19th, receptions, tourist run, gymkhana, &c.; on July 20th, a kilometre hill climb (Leopold II Cup), a kilometre on the flat for tourist cars, and 500 metres hill climb for racing cars (De Caters Cup).



SOUTH HARTING HILL CLIMB.—The impromptu match arranged between the 60-h.p. Napier and the "White" Steam Car. The cars at the starting point. Miss Dorothy Levitt on the left at the wheel of the Napier Car, and Mr. Frederic A. Coleman on the right at the wheel of the "White" Car. Mr. Coleman in this sporting match secured a win, the stake of £25 being, by previous agreement, unconditionally handed over to the Automobile Club for the benefit of any good automobile cause they may decide upon.

SOUTH HARTING HILL CLIMB.—After work, rest awhile. Mr. F. P. Armstrong (one of the marshals), Mr. J. E. Hutton, and Mr. Lionel de Rothschild.

Le Critérium.

UNDER the auspices of the Automobile Club of Belgium, of Namur and Luxembourg, and of Spa, a French touring car trial, to be known as Le Critérium, is to shortly take place. It will commence on the 21st of July, and continue until the 27th of the same month. On the first day the cars will make a run of about 186 kiloms. from Spa to Nijmegen, and will proceed to Bonn, about 191 kiloms. away, on the second day. Luxembourg is the destination on the third day, and makes a run of 226 kiloms. Rheims will be reached on the fourth day (256 kiloms.), while the cars will go to Dinant on the fifth day, this being a run of only 150 kiloms. These first five days bring to a conclusion the purely touring side of the contest, and the cars will have to take part in a speed race, five times round the Circuit de la Meuse (about 500 kiloms.), on the sixth day. It is, of course, expected that the preliminary tour will have eliminated a percentage of the initial competitors, and only those who succeed in reaching Dinant in schedule time will be eligible for the speed contest. Neither is it intended to allow all the entrants to take part in the race, as it has been decided to debar cars entered in categories 1 and 2 of Class I, which will have to compete in a hill-climb up the Spa-Malchamps road on July 27th instead.

In Class I there are six categories, in which cars may be entered according to their total piston area. A definite mean speed is specified for each category, also a minimum total load to be carried by each car. Would-be competitors, who are ineligible for Class I, may enter in Class II, and will be allowed to take part in the five days' tour, but will be prohibited from racing on the sixth day. They will, however, be allowed to join categories 1 and 2 of Class I on the hill climb. There is yet another class (Class III) in which cars may be entered, and it has apparently been formed with the object of enticing private owners, for the only obligation is that entrants in this class should submit to official control when starting and on arrival at their destination, and for doing this all those who succeed in completing the five days' run will receive a medal and a certificate.

Various fêtes, banquets and receptions will, as usual, be organised in honour of the participants by the automobile clubs of the districts visited. Entries already received are well on the way to 50.

The following is a table of categories in Class I :—

Cat.	Max. total Piston Area.	Equivalent Bore.		Mean Speed.	Minimum Load.	Allowance.*
	cm².	cyls.	Bore mm.	k.p.h.	kilos.	kilos.
1	113,097	1	120	20	600	10
2	226,194	2	120	25	800	5·7
3	283,530	4	95	30	1,000	25
4	346,360	4	105	30	1,250	12·5
5	490,876	4	125	30	1,500	12·5
6	615,753	4	140	30	1,750	16

* This allowance is per millimetre of bore by which the cylinders are less than the maximum measurement for their class as specified in the fourth column above.

"Coupe de France."

ANOTHER French newspaper competition is announced. It is being organised by *Le Matin*, in conjunction with *L'Auto*, and will consist of a 6,000 kilometre tour through France, passing through the principal watering places from the coast of Normandy to the Spas in the Pyrenees. It is of course intended, on paper at any rate, to restrict the competition to a run, and not allow it to degenerate into a race. Reliability, economy, and the behaviour of the tyres will form the three main sections under which results will be decided, but each section will be kept quite distinct, the last being reserved for manufacturers only. One of the special features of the competition is that the routes will not be made known until the evening of the previous day. Each stage will be approximately 300 kiloms. long, and the trial will last over about 25 days, including days of rest. For the first three categories, a mean speed will not be above 25 kiloms. per hour, and for the tyre section, regulations have been made which restrict the sizes to be employed in each class. August 2nd is the day selected for the start, which will take place from Paris.

SOUTH HARTING HILL CLIMB.—Messrs. H. Montague Napier, S. F. Edge and W. H. White secure a point of 'vantage from which to watch the cars on the hill.

SOUTH HARTING HILL CLIMB. — Secretary Orde is drastic in his methods for counterbalancing the heat during his official duties.

Glidden Trophy.

PARTICULARS are now to hand of the route, &c., for the Glidden Trophy contest in America. It will be run in conjunction with the annual A.A. Association Tour, members being able to enter for either the pleasure trip of the A.A.A. or to actually compete for the Glidden Trophy, entries for the latter being confined to touring cars with tonneau body, seating at least four persons. The A.A.A. tour will begin at Chicago and finish at Bretton Woods, in the White Mountains. The actual contest for the Glidden Trophy will commence at Buffalo on July 12th, the conclusion for this being on July 26th at Bretton Woods. The total mileage from Buffalo to the latter point, which will be the course for the Glidden Trophy, is 1,029 miles. The main points touched from Buffalo will be Rochester, Syracuse, Saratoga, Elisabethtown, Lake Champlain, Montreal, Three Rivers, Quebec, Jackman, and Rangeley.

Du Pré Challenge Cup Hill Climb.

AT the annual inter-club hill climb for the Du Pré Challenge Cup, which took place on Hazelwood Hill, near Duffield, Derbyshire, on Saturday last, Daimler cars were—as at South Harting and elsewhere—again well to the fore. As indicated in our table, the fastest time was made by Mr. F. A. Bolton's 35-h.p. Daimler, the second and third places being secured by 30-h.p. Daimlers, entered by Mr. W. M. Hutchinson and Mr. E. W. Wells respectively, while only two-fifths of a second separated the 22-h.p. Minerva and the 30-h.p. Rolls-Royce, which came next in order of speed. Just previous to the start an accident occurred to the 40-h.p. Daimler car—which car is shown in our photograph going up the hill—but fortunately neither car nor passengers were injured. When rounding a corner another car was suddenly seen just ahead, and the quick application of the brakes causing it to skid, it ran up a bank and turned over.

The cup is to be awarded to the car that achieved the most meritorious performance, the decision resting with the A.C.G.B.I. The management of this successful meeting was in the hands of Mr. R. Sutton Clifford, who must be congratulated on the excellent arrangements, and of Mr. Booth Granger, hon. sec. Notts A.C.; Mr. A. McAlpin, hon. sec. Leicester A.C.; Mr. Chas. J. Allin, hon. sec. Derby and District A.C. Messrs. F. K. Ward and Chas. Perry officiated as timekeepers.

DU PRÉ CUP HILL CLIMB TIMES.

Car and Driver.	Time.	
	m.	s.
35-h.p. Daimler (F. A. Bolton)	1	14⅕
30–40-h.p. Daimler (W. M. Hutchinson)	1	28⅘
30–40-h.p. Daimler (E. W. Wells)...	1	32⅕
22-h.p. Minerva (J. A. Doran)	1	52⅖
30-h.p. Rolls-Royce (J. A. Doran)...	1	52⅘
25–36-h.p. Brasier (M. R. Browne)	2	0⅖
18–22-h.p. Daimler (C. T. Leech)...	2	4
20-h.p. Rolls-Royce (Capt. Byron)	2	11⅘
26–30-h.p. Argyll (R. Cripps)	2	16⅕
16–20-h.p. Humber (G. A. Strutt)...	2	24⅗
22-h.p. Minerva (E. A. Arnott)	2	25
12–16-h.p. Talbot (Dr. R. G. Hogarth)	2	28
16–20-h.p. Humber (J. A. Harper)	2	29⅘
16–20-h.p. Humber (T. C. Pullinger)	2	39⅕
15-h.p. Darracq (L. P. Mell)	2	40⅖
3½-h.p. Minerva tricar (J. Burford)...	2	47
20-h.p. Ryknield (A. J. Clay)	2	53⅗
20–32-h.p. Darracq (H. J. Marsden)	3	2⅖
16-h.p. Minerva (Capt. Byron)	3	10⅖
10-h.p. Darracq (Dr. H. W. Boreham)	3	39⅖
10-h.p. Peugeot (H. E. Barron)	3	43⅘
10-h.p. Wolseley (G. F. Reading)	3	47⅖
8–10-h.p. Humber (C. J. Allin)	3	59⅕
12-h.p. Brasier (R. S. Clifford)	4	10⅕
8-h.p. Rover (Cyril H. Smith)	4	41⅕
8-h.p. Waite (J. Toller Eady)	5	28⅖
8-h.p. Swift (G. W. Dawson)	5	38⅕
10-h.p. Wolseley (H. C. Reading)...	stopped.	

DU PRÉ CHALLENGE CUP.—Mr. E. W. Wells' 30-40-h.p. Daimler Car travelling up Hazelwood Hill. This was the car which was turned over before the hill climb, but was righted without any damage to car or occupants, and duly driven in the competition.

SCOTTISH RELIABILITY TRIALS.—Mrs. Loder, the only lady driver who got through the whole trial successfully. Mrs. Loder, who drove No. 39—a 20-30-h.p. Pilain car—throughout the four days' trial, secured non-stops each day.

ECHOES FROM THE SCOTTISH RELIABILITY TRIAL.

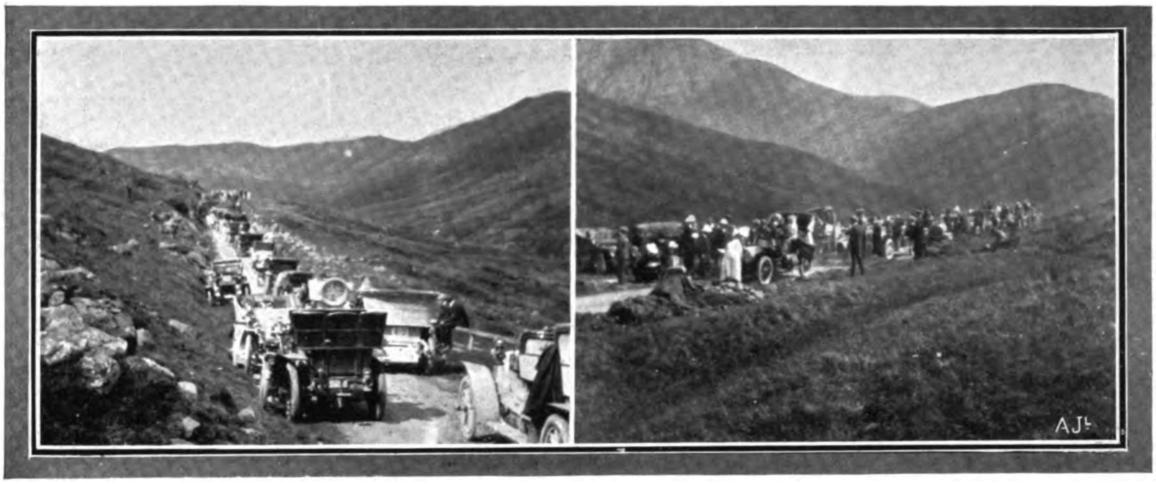
A few corrections are needed, and a little additional information may also be given, by way of appendix to our full report of last week, although no further official facts and figures have as yet been issued by the Scottish Automobile Club. Firstly, attention should be drawn to a slight injustice which was unintentionally done in our large Table of Results (p. 768) to the Swift Motor Company, for, in the final column of that table, some of the time spent on the road in attending to the tyres of their 9–10-h.p. car was included as a reliability delay, whereas the stop in question actually had no effect upon the marks earned by that vehicle. The true facts are correctly stated in the other columns of the same table, but the summary column should have read 3 (2 T—56, R—1m.) instead of 3 (2 T—49, R—8m.). Mention, too, should be made of one of the headings in Table II, the average gradient of the Bridge-of-Avon Hill being, of course, 1 in 9·3.

Referring to the account given by "J. P. H." concerning the Mass car episode in the neighbourhood of the Bridge-of-Avon on the third day, Mr. F. W. Peckham writes to say that his small Maxwell was at the time *following*—not preceding—the Mass car up the dreaded hill. He also states that it was he who assisted the driver of the overturned vehicle to escape from his position, and that the only reason why his own car came to rest was that the petrol tank was quite empty. After replenishing the tank he proceeded on his way without difficulty.

At the foot of Birkhill. Mr. P. W. Northey on the Rolls-Royce Tourist Trophy car waiting his turn in the line.

Looking down Birkhill Valley. Note the array of photographers at work.

SCOTTISH RELIABILITY TRIALS.



SCOTTISH RELIABILITY TRIALS.—Two views of the cars massed at the foot of Cairnwell Hill.

Curiously enough the little Adams-Hewitt car got lost upon the railway in transit to Glasgow, and was only received by Mr. R. R. Smith a few hours before the early morning start on the first day. Considering that no time was available for testing it before the actual trial began, its behaviour throughout the arduous four days' run was, therefore, all the more meritorious, and speaks well for the works-efficiency of its British makers.

Apparently misplaced good nature was responsible for having rendered it an open question as to whether the 6-cylinder Humber made a non-stop run or not on the fourth day. It seems that the road was suddenly blocked by two cars, when the Humber was travelling at a high rate of speed up one of the hills, and that the driver was subsequently compelled to "back" into the ditch. Then it was that some friendly spectators helped to push the

On Cairnwell Hill. Mr. MacCormick on the 24–32-h.p. Gladiator at the starting tape.

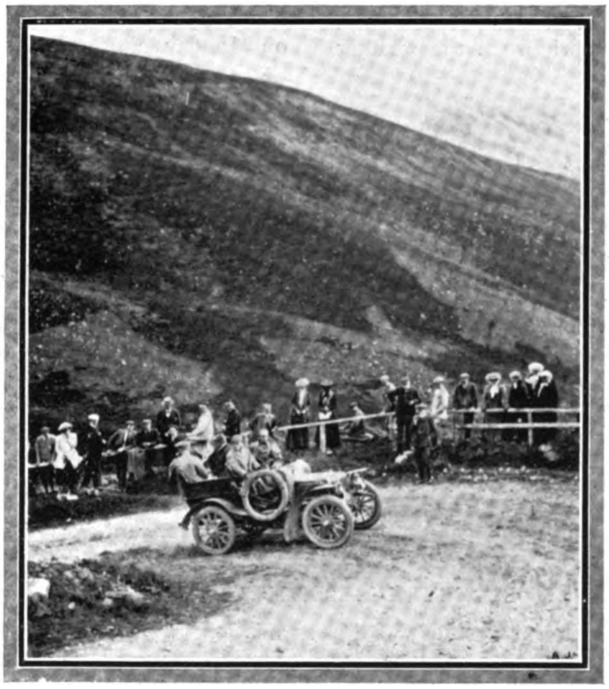
Mr. Mawdsley Brooke at the wheel of his 26-h.p. 6-cylinder Brooke car, which went through the trial so splendidly until the breaking of a magneto-pin compelled him to retire.

Mr. Leverett waiting his turn at the foot of Cairnwell Hill on his 6-cylinder Standard.

The 24-h.p. Mass, the car which was overturned on the third day. Miraculously no passengers were injured, and the car was able to successfully complete the four days' trial. Mr. A. F. King was the driver of this car.

Blairgowrie, the luncheon place on the second day.

The starting line for the Cairnwell Hill Climb. Note the white-hatted officials.

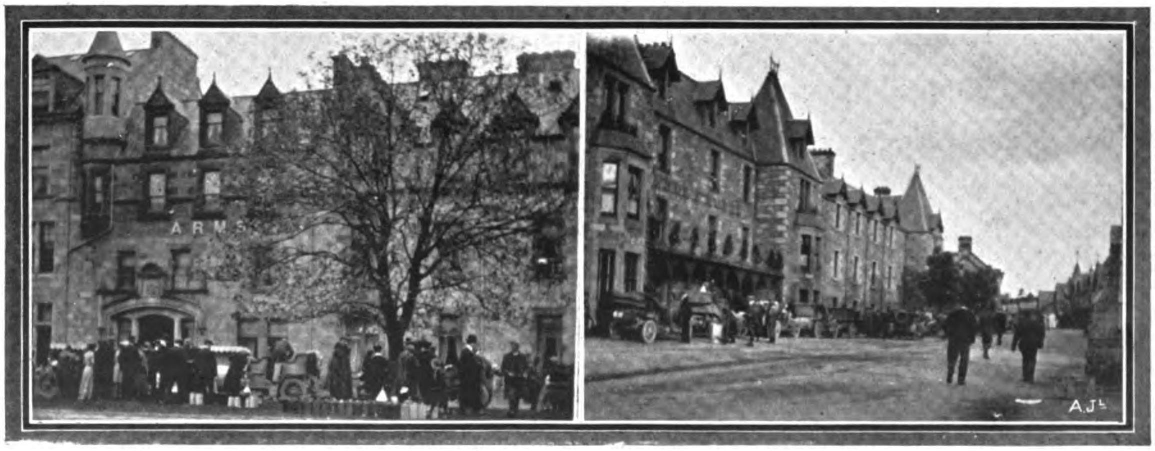


SCOTTISH RELIABILITY TRIALS.—At Devil's Elbow. An anxious moment when one of the cars started backing down this very awkward bend.

car out again, although the engine was running all the time, and there was no reason to suppose that it would require any assistance. Such at any rate is the unofficial version which we have received of the occurrence. In a somewhat similar way it was apparently lack of acquaintance with the course that prevented the driver of the 16–20-h.p. Humber from making an even better showing. Gravity feed, combined with a low level of petrol in the tank, led to starvation of the carburettor on the abnormally steep inclines, and this caused temporary stoppages which could easily have been avoided if due precautions had been taken.

Many of the competing vehicles made very good runs back to their English homes after the conclusion of the trials. The Iris, for instance, left Glasgow at six o'clock on the Monday evening, and, in the hands of Mr. Legros, was at the Willesden works twenty-four hours later. No attempt was made to do anything startling, either in the way of speed or of record breaking. Except for replenishing at Carlisle and Newark, the car required no attention.

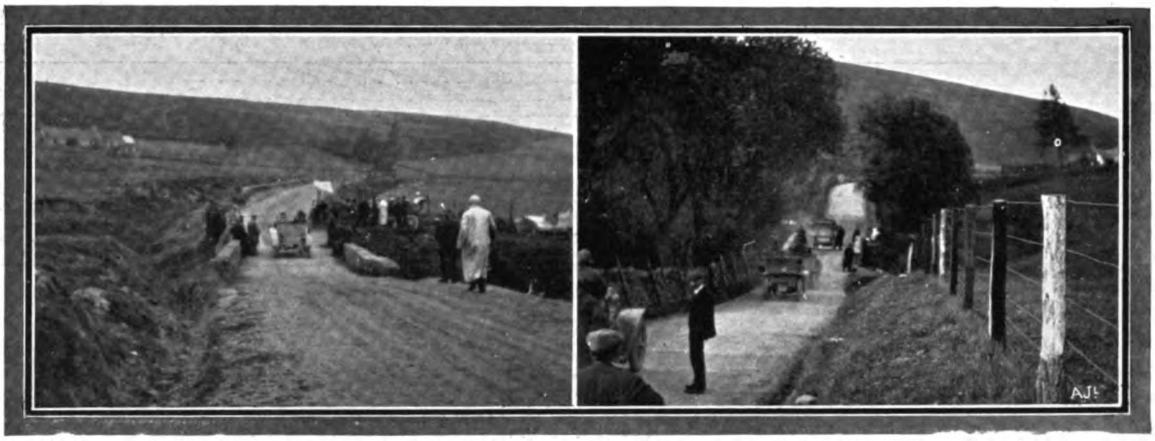
During the trial many of those who took part in that very enjoyable, but in some ways strenuous, tour through Scotland had an excellent opportunity of testing the undoubted merits of "Plasmon" for motorists. This remarkably compact and satisfying food was "installed" on quite a number of the competing vehicles with gratifying results, the handy little packets containing



At Grantown, where the cars stopped for lunch on the third day.

The start from Fisher's Hotel, Pitlochry, at 6 a.m. on the last day.

SCOTTISH RELIABILITY TRIALS.



The Bridge-of-Avon, where the cars started for the hill climb on the third day.

The last day's hill climb up Trinafour, looking up the hill.

SCOTTISH RELIABILITY TRIALS.

biscuits and chocolate being in great demand towards the latter half of the long periods that elapsed between breakfast, lunch and dinner. Early morning starts always have their compensations, particularly when the weather is good in summer time, but mid-morning stops waste a lot of valuable time if comparatively long distances are contemplated, and appetites are apt to become unduly keen long before lunch time comes round.

International Events and Foreign Representatives.

AT the International Conference at Pont de Gennes, on Monday, concerning the question of appointing commissioners by various foreign countries to represent the individual interests of the respective nations in connection with international events in different countries, it was decided, subject to the ratification of the recognised clubs

Trinafour Hill Climb on the fourth day, looking backwards from the starting line. The front car is Mr. A. E. Crowdy's 15-h.p. Siddeley.

Looking forward from the starting point up Trinafour Hill. Mr. E. H. F. Slaney's 12-16-h.p. Wilson-Pilcher just being started.

SCOTTISH RELIABILITY TRIALS.

SCOTTISH RELIABILITY TRIALS.—At Inverary, the final stop for lunch on the fourth day at the Argyll Arms Hotel.

respectively, that all regulations governing international contests organised by the recognised clubs shall be forwarded to all the other recognised automobile clubs, and that two commissioners shall be appointed by each country, if they so desire, to watch the interests of their country, without, however, the right to vote in committee.

Gordon-Bennett Cup, 1907.

At the International Conference of Clubs, held at Pont de Gennes on Monday last, it was decided that the date for the next Gordon-Bennett Cup Race should be left undetermined.

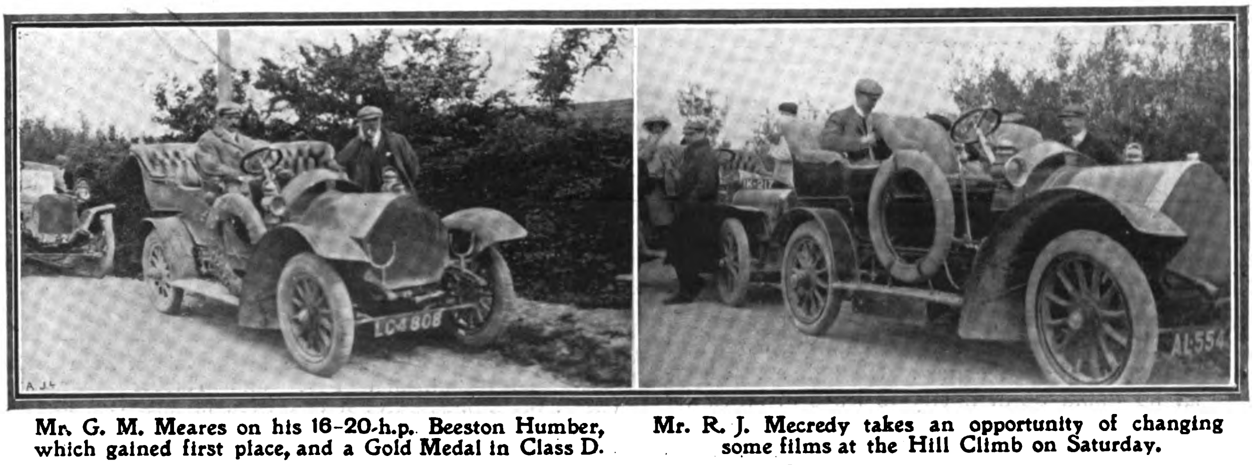
Photograph by Mr. E. White.

IRISH RELIABILITY TRIALS.—A characteristic bit of scenery on the route. Mr. H. Whitworth driving his 6-cylinder Napier in the contest.

The Irish Reliability Trials.—Results.

Particulars of this event were given in our last issue, at which time we also published a preliminary announcement of the principal awards. Since then the officials have revised their calculations, and have issued the final results, which we now give in tabular form. Mr. J. B. Dunlop's victory in the Amateur Section, which brings him the Goff Challenge Cup, is confirmed, but the order of the names for the first and second places for the Dunlop Challenge Cups has been reversed, so that Mr. S. T. Robinson, with his 20–24-h.p. Talbot car, now wins the 200 guinea cup, while Mr. Harvey Du Cros, jun., secures the 100 guinea cup with his 25–30-h.p. Austin car. Owing to the differences in the formulæ, by which the various rewards were allotted, there is an apparent discrepancy between the placing in the classes and for the challenge cups, thus it will be noticed that although Mr. J. B. Dunlop wins the Goff Challenge Cup he is not first in his class, neither is Mr. Robinson nor Mr. Harvey Du Cros, both of whom are placed below Mr. T. Henshaw, who drove the 28-h.p. Daimler. One of the most notable performances in these trials has been that of the Humber cars, for two 16–20-h.p. models won both the open and amateur sections in their respective classes, while Mr. Dunlop, with his 10–12-h.p. car, would have been first in his class also but for an unfortunate stop, caused by taking a wrong turning on one of the runs. In any case he was, as we have mentioned, successful in securing the Goff Cup, so that the performance of the three Humber cars, considered as a team, is undoubtedly worthy of special comment. It will be noticed that the Cadillac car has repeated the successful running which characterised its performance in the Scotch Trials, and has secured the gold medal in Class B.

The system of marking, particulars of which have already been given in The Automotor Journal, is, it will be remembered, so arranged that the best car under any heading receives the maximum marks for its performance, while the other competitors receive fewer marks in proportion; their performances being considered relatively to the first car. In our Table, these marks are placed in the columns headed "Classification." In the hill-climb competition, however, two sets of marks had to be calculated, because the "Classification" system was not adopted in connection with the Goff Cup. Both sets of figures will be found in our Table, and it is the differences between these two calculations which is largely accountable for the fact that the Challenge Cup winners did not come out first in their respective classes. Under the "Economy" heading, too, it will be noticed that there are two sets of figures, one of which gives the actual ton-miles per gallon. It was the latter figures also which were used in connection with the Goff Cup formula.



Mr. G. M. Meares on his 16-20-h.p. Beeston Humber, which gained first place, and a Gold Medal in Class D.

Mr. R. J. Mecredy takes an opportunity of changing some films at the Hill Climb on Saturday.

IRISH RELIABILITY TRIAL.

THE IRISH RELIABILITY TRIALS.—TABLE OF RESULTS.

Car and Driver.	Reliability (Maximum 900)	Economy.		Hill Climb.		Total Marks Classification.
		Classification (Max. 35).	Ton Miles per Gallon.	Classification (Max. 100).	"Goff Cup" Formula.	
Amateur Section.						
CLASS A (*under* £200).						
*T. W. Murphy (6-h.p. Rover)... ...	896	35	25·38	100	71·98	1031
CLASS B (*under* £300).						
*W. Heaven (10-h.p. Cadillac)... ...	896	32	25·75	100	61	1028
Miss E. M. Wheeler (8–10-h.p. Rover)	877	35	28·21	85·07	32·80	997
CLASS C (*under* £400).						
*Col. Knox (12-h.p. Orleans)	898	23·92	30·10	100	90·99	1021·92
J. B. Dunlop, jun. (10–12-h.p. Humber)	898	29	36·50	94·60	91·72	1021·60
P. Hallinan (10–12-h.p. Clement) ...	879	35	44·03	69·35	90·2	983·35
CLASS D (*under* £550).						
*G. M. Meers (16–20-h.p. Humber) ...	900	19·14	23·44	100	93·06	1019·14
E. C. Herdman (20–32-h.p. Darracq)...	883	35	42·87	94·93	90·88	1012·93
W. D. Sainsbury (14–16-h.p. Argyll) ...	900	24·41	28·47	77·32	87·9	1001·73
CLASS E (*under* £700).						
*T. Henshaw (28-h.p. Daimler) ...	900	29·62	26·85	100	97·11	1029·62
T. L. Plunket (28-h.p. Daimler) ...	867	20·31	16·99	With	drawn.	
Capt. L. Knox (22-h.p. Orleans) ...	899	35	31·48	60·3	85·3	994·3
CLASS F (*above* £700).						
*Sir W. G. D. Goff (20-h.p. Clement)	896	35	28·17	72·71	73·36	1003·71
R. W. Morris (40-h.p. Ariel)	869	16·53	13·30	100	82·86	985·3
H. Whitworth (40-h.p. Napier) ...	864	31·4	25·28	With	drawn	
Open Section.						
CLASS A (*under* £200).						
Chambers Bros. (8-h.p. Chambers) ...	900	35	33·11	100	77·6	1035
T. W. Murphy (6-h.p. Rover)	896	26·83	25·38	75·96	71·98	998·79
CLASS B (*under* £300).						
J. E. Mills (8½-h.p. Talbot)	899	35	17·16	100	97·68	1034
Turner Bros. (10–14-h.p. Globe) ...	870	29·15	14·29	60·17	58·2	959·32
CLASS C (*under* £400).						
Argylls, Limited (10–12-h.p. Argyll) ...	882	35	35·01	100	72·20	1017
CLASS D (*under* £550).						
T. C. Pullinger (16–20-h.p. Humber) ...	900	31·64	31·46	73·78	91·65	1005·42
W. F. Peare (15-h.p. Gladiator) ...	900	31·18	30·99	71·76	92·3	1002·94
J. C. Moore-Brabazon (22-h.p. Minerva)	874	28·54	38·37	100	105·37	1002·54
G. M. Mears (16–20-h.p. Humber) ...	900	23·58	23·42	77·32	93·06	1000·90
T. J. Watters (14–18-h.p. Vinot) ..	899	35	34·82	58·31	50·97	992·31
W. D. Sainsbury (14–16-h.p. Argyll) ...	900	28·64	28·47	59·78	87·90	988·42
Argylls, Limited (12–14-h.p. Argyll) ...	900	25·56	25·35	58·79	97·18	984·35
CLASS E (*under* £700).						
T. Henshaw (28-h.p. Daimler)... ...	900	31·71	27·38	100	97·11	1031·71
S.T.Robinson(20-24-h p Clement-Talbot)	900	35	30·23	88·13	100·54	1023·13
H. Du Cros (25–30-h.p. Austin) ...	900	31·34	27·04	88·13	98·98	1019·47
E. M. Stirling (16–20-h.p. Richard-Brasier)	874	26·45	22·93	41·67	75·10	942·12

* Gold Medal.

The Goff Cup.

For best performance in all amateur classes.

Place.		Marks.
1.	J. B. Dunlop (Humber)	1018·76
2.	T. Henshaw (Daimler)	1018·29
3.	Colonel Chaloner-Knox (Orleans)	1012·92
4.	G. M. Mears (Humber)	1011·70
5.	W. D. Sainsbury (Argyll) ...	1011·14
6.	Captain Lindesay-Knox (Orleans)	1009·33
7.	E. C. Herdman (Darracq) ...	1007·95
8.	P. Hallinan (Clement)	1004·20
9.	W. A. Heaven (Cadillac) ...	997·47
10.	Sir W. G. D. Goff (Clement) ...	991·75
11.	W. R. Morris (Ariel)	962·43
12.	T. W. Murphy (Rover)	961·00
13.	Miss E. Wheeler (Rover) ...	932·23

Dunlop Cups.

For 1st and 2nd best performances in Open Classes.

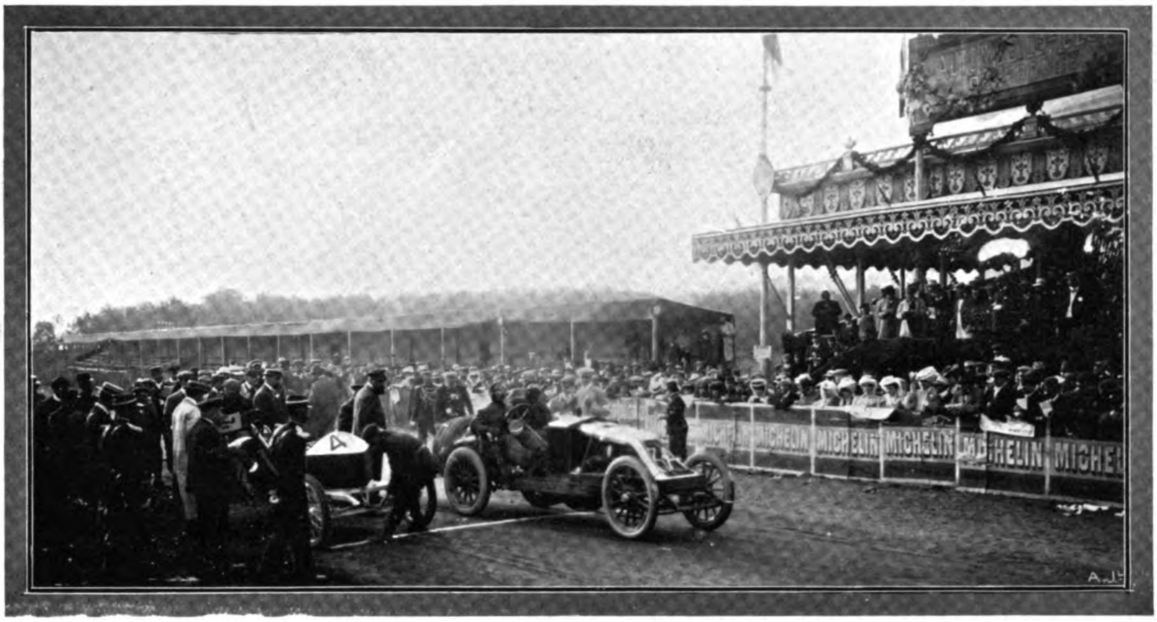
Place.		Marks.
1.	S. T. Robinson (Clement-Talbot)	1030·74
2.	H. Du Cros, jun. (Austin) ...	1025·99
3.	T. Henshaw (Daimler)	1024·46
4.	W. F. Peare (Gladiator)... ...	1023·26
5.	T. C. Pullinger (Humber) ...	1023·08
6.	Argylls, Limited (Argyll) ...	1022·51
7.	G. M. Mears (Humber)	1016·48
8.	W. D. Sainsbury (Argyll) ...	1016·34
9.	J. E. Mills (Clement)	1013·82
10.	Chambers, Limited (Chambers)...	1010·68
11.	J. C. Moore-Brabazon (Minerva)	1007·71
12.	T. W. Murphy (Rover)	993·33
13.	Argylls, Limited (Argyll) ...	989·20
14.	T. J. Watters (Vinot)	984·76
15.	E. M. Stirling (Richard-Brasier)	972·01
16.	Turner Bros. (Globe)	942·48

Resignation of Mr. E. A. Greathed.

WE learn from Mr. E. A. Greathed that he has tendered his resignation as assistant secretary to the A.C.G.B.I., this under ordinary circumstances taking effect at the end of November next. We understand, however, that he would be at liberty to leave at an earlier date if any fresh arrangements that he may decide upon renders that course more convenient to him. He has become so closely associated with club trials and other events that his well-known figure will be missed by all those who attend these important functions.

For the Tourist Trophy Race in the Isle of Man this year, the Continental Tyre and Rubber Company (Great Britain), Limited, have offered another 100 Guinea Cup. This is to be manufactured by Messrs. Elkington and Co., and the design, as will be seen from our photograph above, is of a very artistic character. The conditions attaching to the Cup naturally require that Continental tyres shall be used by those cars which hope to secure this extra prize.

THE FRENCH GRAND PRIX.



FRENCH GRAND PRIX.—The start of Szisz on his Renault—3A. Szisz made the best time of 5h. 45m. 30⅖s. over the distance of 619·08 kiloms. on the first day, beating the next best by 26m. 10⅕s., his advantage being largely due to the system of changing tyres adopted. On the second day, he further increased his lead (although Nazzaro gained nearly 9 mins. upon him), winning the race easily in 12h. 14m. 7s. for the 1238·16 kiloms.

GRAND PRIX.—RESULTS, WITH APPROXIMATE AVERAGE SPEEDS.

(Subject to official confirmation.)

Car and Driver.	1st Day (384·696 miles). Time.	1st Day Average Speed.	2nd Day (384·696 miles). Time.	2nd Day Average Speed.	Total Distance (769·392 miles). Time.	Total Average Speed.
	h. m. s.	m.p.h.	h. m. s.	m.p.h.	h. m. s.	m.p.h.
105-h.p. Renault (Szisz)	5 45 30⅖	66½	6 28 36⅗	59¼	12 14 7	62¾
110-h.p. Fiat (Nazzaro)	6 26 53	59½	6 19 33	60¾	12 46 26	60
125-h.p. Bayard-Clement (Clement) ...	6 11 40⅗	62	6 38 5⅖	58	12 49 46	59¾
125-h.p. Hotchkiss (Shepherd)	6 30 45	59				
110-h.p. Brasier (Barillier)	6 31 48⅕	58¾				
105-h.p. Renault (Richez)	6 35 47	58				
130-h.p. Panhard (Heath)	6 48 12	56½				
130-h.p. Panhard (Teste)	7 1 52⅖	54½				
110-h.p. Fiat (Lancia)	7 12 9⅕	53½				
125-h.p. Darracq (Hémery)	7 26 18⅖	51½				
110-h.p. Gobron (Rigolly)	7 36 8⅕	50½				
125-h.p. Mercedes (Mariaux)	7 39 31⅖	50				
110-h.p. Brasier (Baras)	7 41 43	49¾				
130-h.p. De Dietrich (Duray)	7 58 46	48				
110-h.p. Brasier (Pierry)...	7 59 5	48				
125-h.p. Mercedes (Jenatzy)	8 7 20	47¼				
130-h.p. De Dietrich (Rougier)... ...	8 15 55	46½				

ACCELERATION TESTS.

Records were taken of the times occupied by the various competitors in covering the first 800 metres from their standing start. Most of them did the distance in under 30 secs., and among the fastest were: Teste, on a Panhard, who took 25 secs., Wagner, on a Darracq, and Heath on a Panhard, who each covered the distance in 26⅖ secs., and Duray, who took only ⅕ sec. longer on his De Dietrich. Other good times were: Le Blon (Hotchkiss), 26⅘ secs., Jenatzy (Mercedes), Fabry (Itala), and Villemain (Bayard-Clement), 27 secs.; Clement (Bayard-Clement) and Florio (Mercedes), 27⅕ secs. Szisz was not particularly fast, his time being 30 secs., and Nazzaro made a bad start.

Speeds Attained in Big Races.

It is interesting to recall the average speeds attained in the Gordon-Bennett Cup and other big races, in past years, in order that a comparison may be made with the cars in the Grand Prix on the Sarthe Circuit.

Gordon-Bennett Cup.	Average k.p.h.
1900. Charron, 20-h.p. Panhard-Levassor, Paris–Lyon, 560 kiloms., in 9h. 9m.	61·81
1901. Girardot, 40-h.p. Panhard-Levassor, Paris–Bordeaux, 555 kiloms., in 8h. 51m. 50s.	59·50
1902. S. F. Edge, 40-h.p. Napier, Paris-Innsbrück, 590 kiloms., 10h. 41m. 58s.	55·00
1903. Jenatzy, 60-h.p. Mercedes, Ireland, 592 kiloms., in 6h. 39m...	89·18
1904. Théry, 75-h.p. Richard-Brasier. Taunus. 564 kiloms., in 5h. 50m. 8s.	96·00
1905. Théry, 80-h.p. Brasier, Auvergne Circuit, 549 kiloms., in 7h. 2m. 42s.	78·42

Florio Cup.

1905. Raggio, 120-h.p. Italia, Brescia, 503 kiloms., 300 in 4h. 46m. 47s.	105·30

Vanderbilt Cup.

1904. Heath, 100-h.p. Panhard-Levassor, 480 kiloms, in 5h. 26m. 45s.	83·60
1905. Hémery, 80-h.p. Darracq, 456 kiloms., in 4h. 36m. 8s.	99·50

FRENCH GRAND PRIX RACE.—At the starting point. General view of the "weighing in," the grand stand being seen in the distance. The racing cars in sight in our picture are Barillier's 110-h.p. Brasier (5B), and Jenatzy's 125-h.p. Mercedes (6A).

THE great 1906 French event has been run and won, and certainly there was no lack of excitement, either in the preliminaries or in the event itself. In fact, experts in excitement declare that there was as much local popular enthusiasm as either the Paris-Berlin or any of the Gordon-Bennett races evoked. For a considerable period before the race the Sarthe circuit was the goal of an immense automobile pilgrimage, and even on the day before the race as many as 10,000 enthusiasts were encamped in the neighbourhood of the course. The result has been the usual extortion by hotel keepers and lodging-house proprietors, in some cases as much as £3 per night being charged for a single-bedded room in an hotel, while houses have been let for the two days of the race for as much as £120. One canny peasant, who possesses a field across which there is a short cut to the course, charged five francs a time for the privilege of crossing it.

The weighing-in commenced on Sunday, when twenty-five cars were dealt with, and finished on Monday, when seven of the remaining nine were passed. The two who failed to qualify were Taveneaux with his Gregoire car and Barriaux with his Vulpes, the former having trouble with his cylinders on the way from Paris, and the latter being so much too heavy that there was no possibility of reducing his weight below the limit. The rest of the competitors as given in our table last week all successfully passed the scales. The weighing ceremony was, as usual, not particularly exciting, though the journalists, especially the French journalists, were anything but delighted at being excluded from the enclosure during the operations. The arrangements for lighting the space in which the cars were parked for the night were very effective. All practising on the course had been stopped at the end of last week, but during this practising some remarkable times were recorded, or at any rate claimed to have been made. Unfortunately, moreover, there had been a few accidents, one happening to an Itala car driven by Graziatti (a non-competitor), which upset through colliding with another car near Ardenay last Friday, causing Graziatti to sustain severe injuries. The driver of the other car was hurled some 40 feet through the air, but, marvellous to relate, was unhurt. Particulars regarding the main features of the cars entered for the event were given in our last week's number.

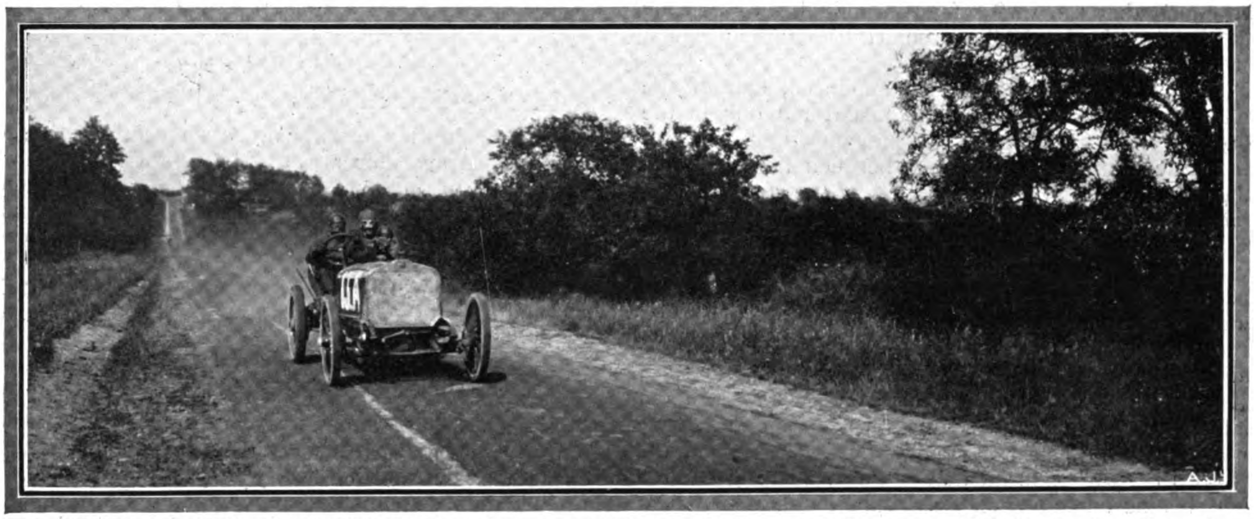
Punctually at six o'clock on Tuesday morning the De Dietrich driven by Gabriel was dispatched from Pont de Gennes, the others following, in the order of our table last week, at 1½ minute intervals on the great two-days' race, in which the cars had to complete a total distance of 1238·16 kiloms. (769·392 miles). On each day of the race the cars travelled six times round the triangle of 103·18 kiloms. (64·116 miles)—a distance of 619·08 kiloms. (384·646 miles).

FRENCH GRAND PRIX, 1906.—One of the De Dietrich racing cars and the three drivers of the De Dietrich team, MM. Rougier, Gabriel, and Duray (reading from left to right).

Although Gabriel, on his huge De Dietrich, was the first to receive the signal to start, Lancia, mounted on a Fiat, was actually the first to cross the line, because his rival experienced a slight delay in getting his machine under way. It was singular, however, that Lancia's fine dash to the front on behalf of the Fiat team should have been marred to a certain extent, a little later, by the bad start made by the two other drivers of Fiat cars, for both Weilschott and Nazzaro were apparently rather nervous, and consequently failed to get under way with their ordinary coolness—both allowing a full minute to slip by.

Happily no one was hurt throughout the day, although those who watched the race with such keen interest were not spared the occasional excitement of a false alarm. In fact, Baron de Caters was at one time said to have been killed, but, faithful to his reputation for giving the lie to such reports, which must by now have become familiar to him, he was subsequently able to show that he was not even badly hurt.

It was almost a miracle, too, that there were not more accidents, for the dust clouds became particularly dense, in spite of the special preparations which had been put on the surface as preventatives. Even as it was, driving, while protected by the best of goggles, became a painful process—largely in consequence of the dust-laying preparations—and certainly the dust did not add to the enjoyment of the spectators, who were standing in their thousands under the intensely hot rays of the sun.



FRENCH GRAND PRIX RACE.—On the course between Sceaux and Connere. 13A, the leading Bayard-Clement Car, with A. Clement at the wheel, which was second on the first day and finished third.

Tyres, as usual, in such mad, high-speed events, gave a lot of trouble, and on this occasion the performances of many of the cars have once again been entirely marred by them. It was in the very first round that Le Blon came to grief, at St. Calais, on his Hotchkiss, through this cause, and although he actually succeeded in uprighting his overturned car, and in repairing a broken wheel sufficiently to proceed with the race, he had to retire soon after at Vibraye. Jenatzy was also unfortunate in the third round, but to a less extent, as he only had to discard the damaged driving tyre, and was able to drive for a time on the rim.

Duray was successful in making the best time of the first lap, for he drove his De Dietrich round the circuit in 52 mins. 32⅕ secs. Baras, on a Richard-Brasier, was only four-fifths of a second slower, however, while Weilschott occupied 53 mins. 40 secs., which was an excellent performance in view of the fact that he had lost a full minute in getting his Fiat under way at the start. Pierry, on another of the Brasiers, came along in 53 mins. 58⅗ secs., while Teste, on his Panhard, ran round in 55 mins. 39⅗ secs. During the second lap, Edmond, on one of the Renaults, unfortunately had his goggles broken by a flying stone, and a piece of glass entering his eye made it imperative for him to pull up when he again reached the starting point. M. Grus actually took his place at the wheel with the intention of continuing the race in Edmond's place, but this was objected to by an official. In the meantime, however, Edmond had met Dr. Henri de Rothschild, who removed the glass, and while the officials were discussing the situation he rushed back to the course and once more took up the running himself.

With these exceptions the first two rounds were completed without incident, and the competitors entered upon the third lap. This, however, proved disastrous both to Gabriel and to Fabry, for the first had to retire through a broken side-chain caused through the accidental detachment of a non-skid device, while the latter ran his Itala car into a wall, completely wrecking it, although happily without doing serious damage to either himself or his mechanician. Yet another competitor was to be upset before the day was over, but it was not until the sixth lap that Weilschott, who had been driving remarkably well on his Fiat, met with his accident at Bouloire. Hanriot and his Darracq also had to retire in consequence of a broken cylinder.

In spite of the fact that the drivers had to change their tyres themselves, with only the aid of their mechanics, nearly all the competitors had recourse to the limited number of depôts at which most of these replacements had to be effected. One noticeable fact, however, is that some of the makers had evidently considered it a justifiable opportunity for testing detachable rims as a means of facilitating the process, and it is certainly worth remarking that Edmond, whose Renault car was thus fitted, managed to replace both his driving tyres in less than two minutes.

At the conclusion of the first day, it was found that Szisz had made the best performance on his Renault, for he managed to bring his car into the leading position by the end of the fourth lap, and this lead he maintained till the end, his time for the six rounds being 5 h. 45 min. $30\frac{2}{5}$ secs., which is equivalent to an average speed of about $66\frac{1}{2}$ miles an hour. Our table also gives the corresponding times and speeds of the other relatively successful competitors. It was Baras, on his Brasier, however, who actually scored the fastest lap of the day, his time during one round being 52 min. $25\frac{2}{5}$ secs., which is equivalent to an average speed of no less than 119 kiloms. per hour ($73\frac{1}{2}$ m.p.h.).

An ingenious system was adopted for sending off the competitors on the second day's run, for although Szisz actually started at six o'clock, the timekeepers set back their watches so that his time of departure was recorded by them as being 5.45.$30\frac{2}{5}$ a.m., this being his elapsed time for the first day's circuit.

It is not obvious why the timekeepers chose to wait until six o'clock before actually starting the first competitor, for this fact in itself must have somewhat frustrated the fulfilment of the scheme, which was evidently designed, partly at any rate, to enable the spectators to better judge of the progress of events, by arranging that the time of day should be numerically identical with the hours occupied since the original start of the contest.

It was, as we have already announced, part of the rules that the competitors should start not only in the order in which they arrived the previous night, but with the same actual time difference between them, so that the first man in at the conclusion of the second day's race should be the winner.

Prior to the time of departure, great excitement prevailed owing to the work which the competitors had to perform on their cars (during "running time") in the way of lubrication and replenishing fuel. Szisz changed two tyres, took in petrol, and adjusted his lubricators in a very great hurry, for he was the first on the list to start. Everyone, in fact, seemed unduly nervous, and of them all Nazzaro was the only competitor who practically gave no attention to his car at all. Lancia, when given the word to "go," unfortunately stopped his engine, and after his mechanic had restarted it, he let in his clutch so quickly that the mechanic had to clamber on to the bonnet.

Hémery also experienced trouble in getting under way, and had to push his car over the line so that he might set to work to find out what was the matter. Much to the disappointment of the spectators, too, the famous Jenatzy was no longer at the wheel of his Mercedes, Burton having taken his place. Szisz continued his splendid running throughout the day, and finished his 7th round (including the six covered on the previous day) in 6 h. 47 min. 45 sec.; his 8th round was finished in 7 h. 50 min. 28 sec.; his 9th in 8 h. 48 min. $12\frac{2}{5}$ sec.; his 10th in 9 h. 56 min. $7\frac{2}{5}$ sec.; his 11th in 11 h. 2 min. 13 sec., and his final round—with a broken spring—in 12 h. 14 min. 7 sec.

Szisz thus won the great French race, and in doing so was honoured by the congratulations of M. Barthou, the Minister of Public Works, who was watching the race on behalf of the Government.

It is interesting to note, however, that, although Szisz proved victorious by his well-sustained exhibition of splendid driving, yet actually he was about nine minutes slower than Nazzaro on the second day's running. It must be remembered that the method of starting on this, the second day of the race, was virtually equivalent to starting all the cars simultaneously from scratch on the first day, and allowing them to run continuously without any interval through the night. It naturally added very considerably to the interest of the spectators in the event, for they were able to see how the race was going by merely watching it, and yet not reduced, as spectators so often are on such occasions, to form a mental picture of the relative position, and to make more or less complicated arithmetical calculations. It was thus possible for them to fully appreciate the magnificent and successful struggle which Nazzaro made against Clement for the second place; both were some little way behind the winner, and in the end Nazzaro not only made up his leeway of the first day, but beat his rival by a little more than three minutes.

Unfortunately the day did not pass off without an accident, for, while rounding a corner near Champagne, Teste's Panhard came to grief, and he was thrown out of the car. It appears that he has been seriously hurt, and although it is impossible to gather exact details at the moment, rumour has it that he has sustained a broken thigh, an injured hand, and is suffering from internal injuries.

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AERONAUTICS.

A Military Balloon Pursuit.

An interesting experiment was recently performed by Swiss Army officers at Zurich. The town was supposed to be invested by an army at a radius of nine miles, and the experiment consisted in ascertaining whether a balloon carrying despatches could be successfully pursued and captured. Twelve motor cars, varying from 40 to 60-h.p., took up the pursuit, but the balloon, which rose to a high altitude, escaped them.

Balloon Race.

A contest of much interest is to be held on July 7th by the Aero Club, under International Federation rules. An attempt will be made by the various aeronauts engaged to descend as closely as possible to a certain pre-determined point. The competitors will include Mr. Leslie Bucknall in "Enchantress," Mr. Frank Butler in "Dolce far Niente," Professor Huntington in "Carnation," Mr. C. F. Pollock in "Aero Club," and the Hon. C. S. Rolls in "Venus." Mr. Frank Butler's great Gordon-Bennett balloon will follow the race carrying the judges and observers.

Sunday Ballooning: No Extra Trouble.

Ballooning threatens, after the recent examples we have had of it, to become a recognised form of Sunday amusement. Everyone will feel satisfaction, therefore, at being assured that the enjoyment of the few in this case imposes no extra labour or trouble on the workers of the community. Certain men have to be at work on Sundays at the gas works in any case, and even if the whole of the inflation of the balloon takes place on the Sunday immediately before departure, the process consists in nothing more than attaching the lower apex of the gas-vessel to a big gaspipe and turning on a tap.

Mr. Wellman Starts for the North Pole.

Mr. Wellman, who proposes to reach the North Pole mainly by the aid of an "airship," has already started, with the other members of the expedition, from Antwerp for Arendale, Norway.

MOTOR BOATING.

Motor Yacht Club Racing.

The competitors in for the last club handicap having agreed to allow the handicapping to stand over until certain of the boats have been re-measured, it was impossible to give the winners in last week's notes. Full particulars were received early in the week, showing the results to be as follows :—

		Elapsed Time.			Handicap.			Corrected Time.		
		h.	m.	s.	h.	m.	s.	h.	m.	s.
1st.	Commander ...	1	22	22	0	20	12	1	2	10
2nd.	Ki Wi	2	30	0	1	24	0	1	6	0
	Albatross ...	1	7	15		—		1	7	15
	Napier IV ...	1	7	22		—		1	7	22
	Javelin	1	12	22	0	2	0	1	10	22

At the last meeting of the Racing Committee a new course for future club handicaps was decided upon—starting abreast of "Enchantress," round the "Greenlands" buoy and back five times, finishing at the starting line. Distance about twelve nautical miles. This alteration will enable spectators to keep the boats in view during the whole of the race, and will provide the added attraction of a sharp turn just opposite the ship in each round. It is proposed to start the boats on their handicap time, so as to make a better finish.

Intending competitors in the Reliability Trials are reminded that entries close on June 30th. The courses will be slightly modified this year, especially the "open course," which will be more in the shape of a triangle than last year's straight run out and home; and while fully providing a good test of the behaviour of the boats in a seaway, will keep them more within the field of vision.

Applications having been received for permission to run steam boats in the trials, the committee wish to point out that these trials are intended to test the capabilities of the internal-combustion engine, and they consider that the reliability of the steam engine has by this time been fully established so that no real necessity exists in the interests of the public for any demonstration of this kind. It was found difficult last year to differentiate between the two types, and the issues were apt to be confusing.

It has been decided to give a Cup to the Port of Dartmouth Royal Regatta this year to be raced for by motor boats. The regatta is held at the end of August.

Considerable interest has been taken by the members on board in the trials of an Admiralty picket boat designed by Messrs. Hornsley to use heavy oil (flash point, 220 deg.). One of the most important objects of the club's propaganda is to encourage the introduction of a motor which will satisfy the requirements of the Admiralty and be found useful in the Navy, and any advance in this direction is considered of the greatest importance and interest.

Among the members who have lately joined the Motor Yacht Club are the Hon. Rupert Guinness, Capt. Wyley, R.N., Mr. H. B. Money Coutts, Mr. Lesmoir Gordon, Capt. Lionel Tufnel, R.N., Mr. Stuart Foster, Mr. S. Bircham, and Lieut. J. S. Holmes, R.N.

London to Cowes Race.

Amongst the entries for this race, organised by the British Motor Boat Club, are Mr. L. M. Waterhouse's "Lady Kate," Mr. F. C. Blake's "Tomoye," Mr. A. Westmacott's "St. Helena" (the holder of the Wilson Challenge Cup for sea-going cruisers), Mr. G. Davory's "Teddington," Mr. J. Stirling's "Eola," Mr. E. H. Clift's "Joan," Mr. S. F. Edge's "Napier Major," and Mr. T. Thornycroft's "Fire Fly."

The Return of Napier Major.

Napier Major has once more returned to the Thames, after having successfully completed the second long cruise which she has undertaken; for it was about this time last year, it will be remembered, that this valiant little craft astonished the marine world by undertaking a trip to the Shetland Islands and back. There seems little doubt that the boat had to undergo a much severer trial on this occasion, however, although the actual distance is much the same as it was in the former case, and works out at something over 2,000 miles. In our issue of June 2nd we gave a graphic description from the pen of one of the "crew" of the incidents which had taken place in the first part of the voyage which brought the boat up to Inverness. From this place a good run was made down the Caledonian Canal to Oban, which latter port was reached on May 19th.

After leaving Oban the navigation was very intricate from Corpach at the south end of the Caledonian Canal down to Tarbert, on the east side of the Mull of Cantyre, the course being through one mass of small islands and reefs, with all sorts of tidal eddies and currents. Fortunately the day was fine and no trouble was experienced. The course was continued through the Crinan Canal and then on to Belfast, the sea being very rough between the Mull of Cantyre and the Irish coast. On the 26th a start was made from Belfast and a stop made at Cultra in Belfast Lough, where a regatta was being held by the Royal North of Ireland Yacht Club. Napier Major was quite a feature of the meeting as she cruised round during the races with a party of the members of the Yacht Club on board, including some of the Belfast Harbour Commissioners. After the regatta was over, a run was made down to the Royal Ulster Yacht Club, Bangor, where she was made snug for the night.

Sunday saw Donaghadee left behind, and a course was set for Ramsey, Isle of Man, which was reached on May 28th, after a good run in spite of some trouble owing to the fog. On the 30th Douglas was made, and then the 80 miles from there to Liverpool run down, the distance being done in 9 hours, which was very good for a boat of the Napier Major's class, especially as it was blowing hard from the S.-W., with a lot of rain. The crew had a welcome spell at Liverpool, as a stay was made here for the Motor Boat Regatta, held by the Liverpool Bay Yacht Club on June 8th and 9th, in which Napier Major took part, winning the cruiser race on the 9th. A considerable amount of "educational" work was carried out here in taking people out for a run, in order to try and convert them to enthusiastic adherence to motor boating. Napier Major lay in the dock close to the city, but at first, some trouble was experienced with the harbour authorities, who had not any experience of motor boats, and looked on them principally as a source of danger, which should be under the same regulations as a powder hulk. However, Mr. Hearman had them down on board, and demonstrated to them the precautions against fire and the installation generally, and they went away quite pleased and with a very different impression regarding possible danger.

Kingstown, Dublin, was the next port of call, this logging 1,300 miles from leaving the Thames. This place was reached on June 13th after a very good passage from Liverpool with smooth water all the way, which was quite a change after the buffeting that had been experienced previously. It was slightly hazy, however, but Mr. Hearman's navigation was not at fault, and the landmarks off Kingstown were duly picked up. After leaving Kingstown, a call was made at Rossclare, and then Ireland was left behind, and the boat's head turned to Padstow, in Cornwall. Land's End was rounded on June 16th, and the first acquaintance made with the Atlantic rollers. The Napier Major, however, took them like a duck, and only the top curl of a few of the worst got on board. Smoother water was met with in getting round Land's End, and Falmouth was made the same day, the 230 miles from Rosslare to Falmouth being covered in 30 hours, the latter place being reached on June 20th.

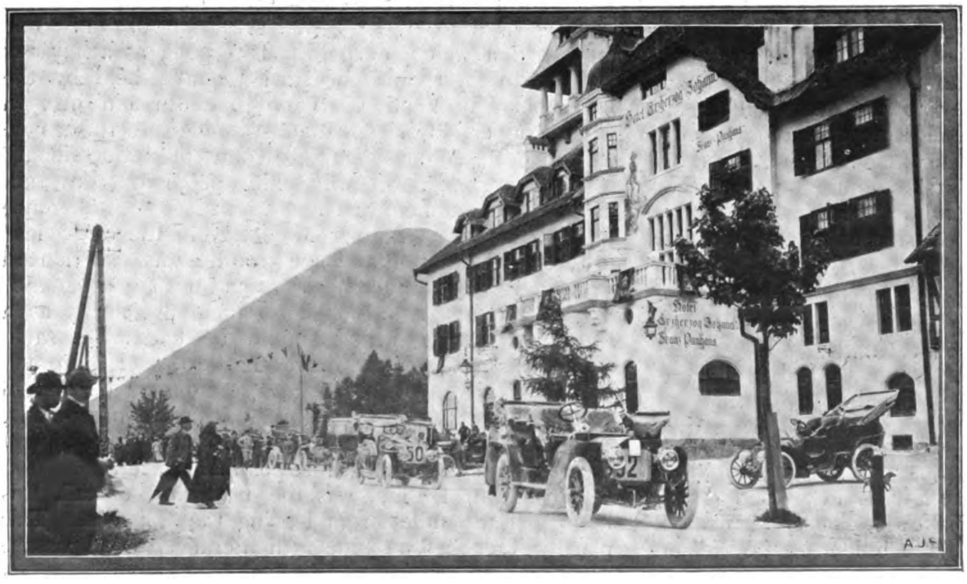
Calls were made at Dover and Greenhithe on Friday evening, the 22nd inst., and the Napier Major arrived back at Temple Pier on Saturday last after 49 days' cruising, having completed a trip of 2,050 miles under very adverse circumstances as regards the weather and with an amateur crew, absolute reliance having to be placed on the performance of the motor. She has not belied the confidence placed in her and has pulled through safely, once more proving how reliable such a craft is when propelled by a properly designed engine.

OPENING OF THE NEW ARGYLL WORKS.

TUESDAY last will remain a red letter day in Alexandria, N.B., for it was the occasion of the formal opening of the new works of the Argyll Company. A very large number of visitors left London on Monday evening by special train, and these were joined by another contingent at Glasgow. Arriving at Alexandria, the train drew up in the Argyll Co.'s own sidings, and the whole company were then shown over the splendidly equipped workshops, which have for some time been in full swing. Having inspected the various processes in the manufacture of the popular Argyll cars, the visitors assembled in front of the building for the opening ceremony, which was performed by Lord Montagu of Beaulieu. As a souvenir of the occasion, Lord Montagu was presented with a handsome silver flower bowl, and upon the doors being thrown open, the guests marched up the truly magnificent marble staircase to the strains of the Argyll orchestra and male choir. At the luncheon, which was served in a large hall forming part of the administrative buildings, Lord Montagu referred in eulogistic terms to the enterprise of the company, and especially commended them on their generous methods which had led them to look so well after the happiness of their men by giving them airy and sanitary surroundings and helping them in the enjoyment of their leisure hours—of which precept the Argyll orchestra and choir is not the only practical example. Mr. W. A. Smith, Chairman of the Company, presided over the luncheon, and was supported by Mr. Alec Govan, Managing Director, and Mr. Eustace H. Watson, Managing Director of Argylls, London, Ltd. After the loyal toasts had been duly honoured, Dr. Robert Crawford proposed the toast of "Automobilism" in a most entertaining speech, which, as Mr. J. C. Percy subsequently said in the course of his remarks, should once and for all refute the popular fallacy that Scotchmen were devoid of humour. In reply to this toast, the Chairman, Mr. W. A. Smith, gave a most interesting account of the *pros* and *cons* involved in the selection of Alexandria as the site for their new works, and referred to the fact that already their judgment had been justified, for they had been able to realise sufficient profit by selling quite a small portion of their large tract of land to enable them to conduct their own works "rent free."

Mr. A. Govan was in charge of the toast of the "Builders and Contractors," and in proposing it he referred to the record speed in which the works had been erected, thanks to the remarkable energy and care of those most directly concerned.

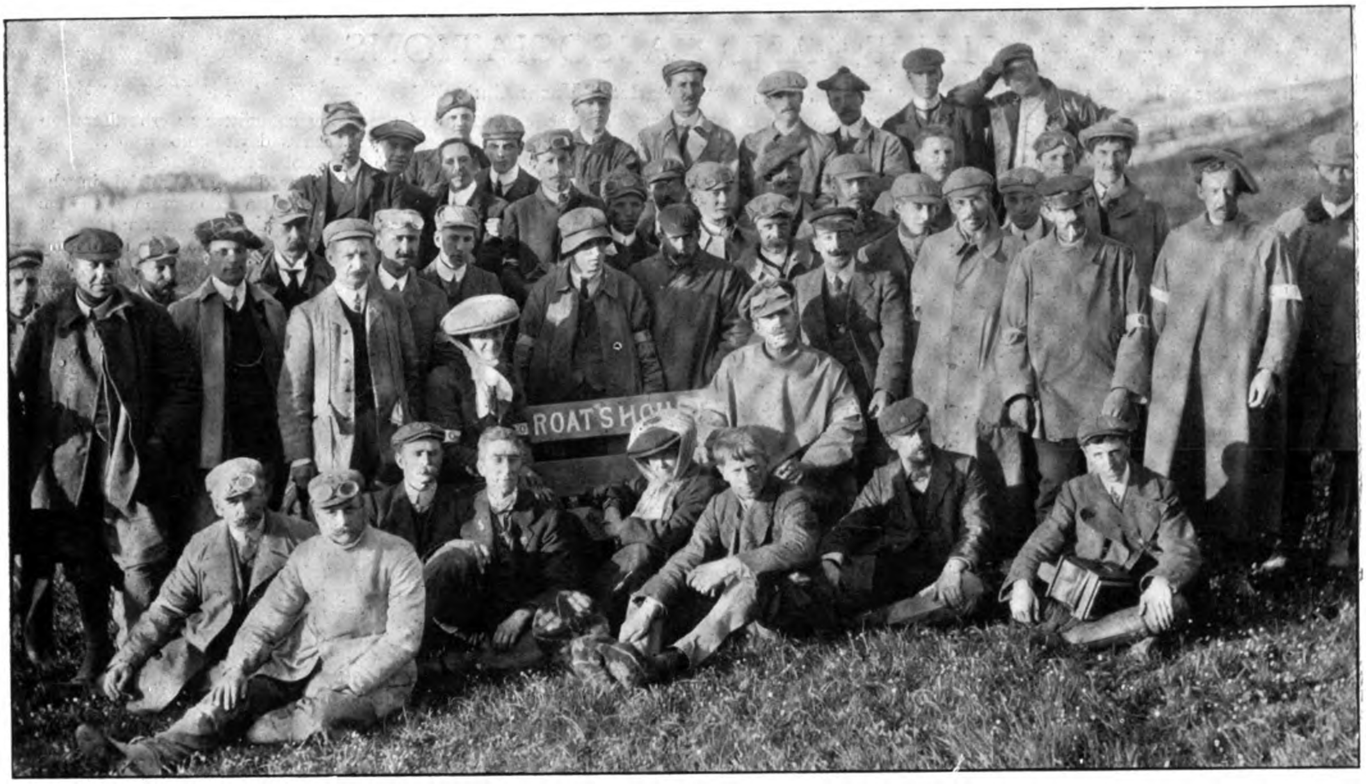
In replying to this toast, both Mr. J. Anderson and Mr. G. L. Allen praised the organising capabilities of Mr. Govan, which alone, they said, had made such dispatch possible, and both took the opportunity of publicly marking their esteem by presenting Mr. Govan, on behalf of their respective firms, with handsome and artistic mementos.



HERKOMER TROPHY.—At the summit of the famous Semmering Hill.

A Fellow Feeling.

A CONSTABLE, who was giving evidence at the Marylebone Police Court in a case in which he had been knocked down and severely injured by a motor 'bus, stated that he at first imagined the 'bus to be skidding, but afterwards discovered that the driver was only learning. The policeman, apparently, would not have raised any objection to being knocked down by a learner, but to sustain a similar misfortune from a mere accidental cause was a really serious matter. There is a suggestion of readiness for martyrdom about this—quite refreshing in our prosaic age.



LAND'S END TO JOHN O'GROATS RELIABILITY TRIAL.—A group of the survivors who got through on this arduous trial recently. Our photograph is taken at John o'Groats. A key to the portrait group appears below.

MOTOR CYCLING.

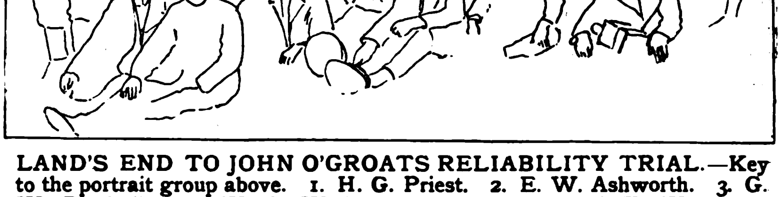
Canning Cup.

THE first reliability race in connection with the biennial contest for the Canning Cup, under the auspices of the Dublin Centre of the Motor Cycle Union of Ireland, took place on Saturday. The Cup, originally presented to the Union by the Hon. Leopold Canning, D.L., was put up for competition between teams representing both Centres of the Union, and by two successive wins became the property of the Dublin Centre, who now offer it for competition open to any member of the Union for the best of a series of reliability tests of one hundred miles non-stop runs. The Cup is to be won twice in succession or three times in all before becoming the property of any individual holder. The competition for the Cup to take place twice in every season. In the event of two or more riders doing a non-stop run in any of the trials for the Cup, the members so qualifying to ride over the course on the Saturday following or the first open date after and so on until all save one are eliminated. Fifteen competitors faced the starter on Saturday at Inchecore Bridge. The journey to Carlow, 49¾ miles, was accomplished within scheduled time by the majority of the competitors.

The return journey was commenced at five o'clock, rain falling until nearing Naas. The following competitors qualified for non-stops:—T. W. Murphy, 3-h.p. Singer; W. H. Meredith, 2-h.p. Triumph; H. Mooney, 2¾-h.p. F.N.; W. Gullfoyle, 2¾-h.p. Minerva; R. E. Price, 2¾-h.p. F.N.; E. Bornfeather, 3¼-h.p. Bourke (disqualified).

St. Mar Cup.

A TWO hundred miles reliability run from Belfast to Derry and back took place on Saturday last, under the auspices of the Ulster Centre of the Motor Cycle Union of Ireland. The event, an annual one, is held in connection with the Cup presented to the Union by the Earl of St. Mar. Four competitors started at 7 a.m. from Fitzwilliam Park Gate, Belfast, and proceeding by Carrickfergus, Larne, Coleraine, Lunewady to Derry, returning by Coleraine, Ballymoney, Ballymena, Antrim, to Glengormby, where three of the competitors arrived within scheduled time as under:—J. Stewart, 3-h.p. Triumph, non-stop; C. Rea, 3-h.p. Enfield, non-stop; A. Bullock, 3-h.p. J.A.P., non-stop; J. S. Garrett, 3-h.p. Rex, retired.



LAND'S END TO JOHN O'GROATS RELIABILITY TRIAL.—Key to the portrait group above. 1. H. G. Priest. 2. E. W. Ashworth. 3. G. W. Blackaller. 4. W. A. Wells. 5. Mrs. Hewlett. 6. T. Woodman. 7. W. Hayes. 8. J. Edge. 9. Miss Muriel Hind. 10. Wilbur Gunn. 11. H. J. Beazley. 12. C. Wakley. 13. Dr. Blandford. 14. D. Poupart. 15. Capt. L'Estrange. 16. F. Straight (Sec.). 17. W. G. Brookes. 18. A. W. Browne. 19. H. G. Cove. 20. J. W. G. Brooker. 21. J. F. Dixon. 22. A. G. Reynolds (Judge). 23. W. Milnes. 24. A. Carpmael. 25. S. Fowler Dixon. 26. H. R. Dougall. 27. J. van Hooydonk. 28. W. W. Harrison. 29. Rev. B. H. Davies. 30. Bramley Moore. 31. F. Hulbert. 32. J. Perry. 33. H. L. Cooper. 34. H. S. Ruddle. 35. A. H. Albert. 36. W. Brough. 37. A. J. MacDonald. 38. H. E. Blackney. 39. F. E. Cox. 40. A. Williams. 41. P. C. Campariole. 42. S. W. Carty. 43. R. Moore. 44. O. Opperman. 45. H. Goodyear. 46. H. Bellinger. 47. J. Tassell. 48. R. M. Brice.

CLUBS AND ASSOCIATIONS.

The Automobile Association.

AT the last meeting of the Association a proposal was put forward recommending the adoption of a scheme by which a subsidiary body should be formed, subscription to which should be three guineas per annum, and all members of this body would be provided with the services of a solicitor familiar with motor car cases to take up their defence without any further payment. The activity of the Association is becoming quite widely effective in preventing breaches of the speed limit, to the no small irritation of those districts which look on police trap-collected fines as a regular source of income. This the Association has been enabled to effect by increasing the number of its members during the last year to the grand total of 978, which, of course, means increased sinews of war, and that means rendering available a greater number of scouts.

Inter-Club Meet at Buxton.

ON the initiative of the Manchester Automobile Club, an Inter-Club Meet of the members of the Manchester, Midland, Yorkshire, North-East Lancashire, Halifax, and Sheffield Automobile Clubs took place at the Empire Hotel, Buxton, last Saturday. The weather was glorious, and attracted a large number of members. There were well over fifty cars present at one time on the spacious courtyard at the Empire Hotel, and as each car had brought a full complement of passengers, the scene in front of the hotel was fairly busy. The motorists and their friends dined together at 7 o'clock. The weather was so favourable in the early part of the day, that most of the members had made arrangements to go home on the Saturday night and kept to this plan, though a heavy downfall, when the time came for their departure, made the surface of the roads very skiddy. Quite a number, however, stayed until after luncheon on Sunday, employing the morning in using their cars to view the beauties of the Peak District. Amongst those present were the president of the Manchester Automobile Club and the chairman of the Yorkshire Automobile Club.

Kent A.C.

ONCE again the members of the club were last week most hospitably entertained by Mr. and Mrs. Austin at their charming home at West Court, Detling. Over fifty members and friends were present and all thoroughly enjoyed themselves.

Members are reminded that the gymkhana takes place at the Maidstone Athletic Ground, London Road, to-day (Saturday). The competitions start at 2.30. The band of the 1st V.B. Royal West Kent Regiment will play during the afternoon by special permission of Major C. R. Smith.

Leicestershire A.C.

OWING to the state of the course in Bradgate Park, the club have decided not to hold the proposed speed trials on June 30th. The committee have, however, arranged for the gymkhana to take place at Garendon Park, near Loughborough, on that day. There will be six events, viz., Glass of Water Race, Adam and Eve Race, Obstacle Race, Ladies' Passenger Race, Ladies' Obstacle Race, and Tilting at Rings. Garendon Park is situated about a mile and a half out of Loughborough, and all cars must enter the park by the Thorpe Gate. The best way to the park from Loughborough is by the Ashby Road, until just short of the first milestone, where turn right and straight ahead. Direction cards will be placed at the turning on the day of the gymkhana.

The Motor Union.

THE EARL OF ABERDEEN, P.C., has been elected a vice-president of the Motor Union.

At the June meeting of the General Committee of the Union, it was reported that the Automobile Club of Great Britain and Ireland had made a contribution of £200 towards the Union's Defence Fund.

It was resolved to contribute towards the tarring of the road at Dunton Green, on the main London-Hastings Road.

A draft letter to manufacturers on the subject of exhaust cut-outs was authorised to be sent.

The Union also resolved to prosecute in the case of one of its members who was assaulted by the driver of a cart.

A successful prosecution for obstruction on the highway was reported, and it was resolved that any cases of assault or obstruction on the highway, communicated to the secretary of the Union, at 1, Albemarle Street, London, W., would be at once investigated with a view to proceedings being taken.

Motor Yacht Club.

AT the last meeting of the racing committee a slight alteration was made in the Cowes race for yacht's davit motor boats. This race has now been extended to boats not exceeding 25 ft.

Mr. Lionel de Rothschild has placed a gold medal in the possession of the committee for award in connection with the reliability trials. He has also offered a prize to the value of £25 for any event in which the committee may decide to award it during the season.

Scottish A.C.

THE negotiations which were taken up a considerable time ago, between the Scottish Club and the Glasgow Corporation, with respect to the regulations governing the use of the carriage drives in the public parks, have had a satisfactory termination, and bye-laws have now been framed according to motor vehicles the same rights as other vehicles. The suggestion was that the former should be excluded during a considerable portion of each day.

Society of Motor Manufacturers and Traders.

IT has been resolved to further reduce the scale of charges for electric light at the November Show, which will doubtless lead to a greater demand, and the decorative effect thereby greatly enhanced.

New members elected are Messrs. T. H. Bottiaux, the British United Engineering Co., Ltd., and Howes and Burley, Ltd.

Having regard to the increasing importance of the Marine Section, which will occupy the whole of the annexe at the April Exhibition, it has been decided to alter the title to "The Commercial Motor Vehicle and Motor Boat Exhibition."

The hearing, before the Comptroller, of Messrs. Renault's application for the amendment of their patent, took place last week. The points of interest to the British motor trade, which have been most carefully worked up by the Society, were put forward on its behalf by Mr. Bousfield, K.C., with whom was Mr. Colefax.

Sheffield A.C.

ON July 5th the Second Annual Gymkhana will be held at Niagara Grounds, Wadsley Bridge. The usual interesting competitions, to the number of ten, are down to take place. No. 8, the "Academy Stakes," should prove a particularly amusing item on the programme, the following being the rules:—"Open for all cars irrespective of power. In this event each competitor selects a lady, who takes up her place at a blackboard. Each competitor is then given a slip of paper on which the name of an animal is written. The competitor starts his car, races to the blackboard, stops his engine, alights, and draws the animal on the board. As soon as the lady names the animal correctly, the competitor restarts his engine, and races back to starting point. The first back wins, and the prize is given to the lady."

Helping Crippled Children.

THAT the weather should prove propitious on July 7th, for the delightful treat on motor cars, which the Sheffield Automobile Club have arranged for the crippled children, will surely be the wish of every automobilist in the kingdom. This date was originally fixed for July 14th, but owing to the Yorkshire Speed Trials at Saltburn on that date, the date has been put forward one week. The children will be driven in a number of cars which are being provided by members and their friends, including the following automobilists:—Messrs. Jno. Atkinson, Herbert Barber, Jas. Barber, P. J. Benson, W. H. Dixon, A. S. Fawcett, A. Firth, T. H. Firth, J. H. Hall, Ben. Hind, J. B. Norton, J. H. Pickford, W. Robinson, G. E. Senior, T. Wilkinson, B. G. Wood, Dr. Thorne.

The drive will be to Bamford *via* Hathersage, returning *via* Ashopton. Any other automobilists who can assist in giving these afflicted little folk an afternoon in the country by the use of their cars, should communicate with either of the following, at Sheffield: T. H. Firth, 3, Crescent Road; G. E. Senior, Ellerslie, Dore; C. A. Thorne, the Glen, Dore.

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For Henley Regatta.

ARRANGEMENTS have been made by the Automobile Club for the reserving of a portion of Phyllis Court for the members of the club during the Henley Regatta, July 3rd, 4th, and 5th.

CORRESPONDENCE.

***The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

HILL-CLIMBING FORMULÆ.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Referring to the various hill-climbs which are now being held in all parts of the country for motor cars, it is to be presumed that, outside providing an interesting afternoon's sport, they should demonstrate in some way the relative merits of the cars taking part in them. At present, however, I think that the value of these tests, so far, at any rate, as the public are concerned, is very considerably discounted by the different methods adopted in the classification of the cars. In some cases an arbitrary formula is used to determine the horse-power of the engine, and this system, if a really reasonable formula was arrived at to determine the engine power, if adhered to by every club throughout the country, would, I think, eventually lead to useful results, but at present the results are far from useful.

For example, take the case of the 40-h.p. 6-cylinder Napier. At Fromes Hill-climb the formula there classed it as a 32-h.p. car. If, however, the same car is run in the Birmingham Hill-climb, it is only called a 30·47-h.p. car, and in view of the fact that the Fromes Hill-climb does not take the least account of length of stroke, it is obvious that their formula is a thoroughly bad one.

The Birmingham formula, which takes into some account the stroke, seems to me far and away the best and most useful hill-climbing formula that we have at present, and if a fair formula of this sort could be adopted as a standard by the Automobile Club, and used throughout the country for, say, a year, and then all the results carefully considered at the end of the year by the Technical Committee of the Automobile Club, I feel sure that modifications and suggestions could then be brought into force from year to year that would make these hill-climbing competitions really useful to the public and to makers of motors, and at the same time make handicapping by them really fair and interesting.

To still further show the extraordinary variation in the system of holding these hill climbs, we will just take South Harting, where the speeds of the different horse-power cars are supposed to be brought together by price. Could anything be more futile than this, and last year when this same competition was held under these conditions, I was actually told by an official in connection with the trials that the reason the price of the cars competing in this competition had been limited to £850, was because the promoters of the competition did not wish very powerful cars to compete. Could anything be more ridiculous than to suggest that a price of £850 for the chassis would prevent a powerful car competing. There are many cars of 50-h.p. and more to be bought at this figure, so that the competition, although it makes an interesting afternoon's sport, is really useless as an educational competition to everybody concerned.

When we come to Aston Hill-Climb, promoted by the Herefordshire Club, here we have an even worse state of affairs. There appears to be no limit to horse-power, no limit to price, but the cars, it is stated, must be fully-equipped touring cars. No indication is given as to how many people are to be carried, and what is a touring car is not defined.

Now it seems to me that this is bad, as it leads to protests and misunderstandings which need never arise if some good rating rule on the lines of the Midland Club was universally adopted, tried throughout a whole season, and then at the end of the season thoroughly criticised by the results, and gradually improved from year to year, and directly cars were inclined to strike out in undesirable directions, then the formula could be so altered as to place at a discount this particular direction of development.

Trusting that this matter may have some ventilation in your columns, and that opinions from others may be given with the hope of getting something done before next year's competitions start, and that some competition be held during the present season, under what might be considered ideal conditions at the moment.

Yours truly,
S. F. EDGE.

June 18th.

CUBIC CAPACITY AND EFFICIENCY.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—A persistent attempt has been made to damage my reputation as a good sportsman respecting a challenge which I issued. It is claimed that a test has proved that the wager was lost by me. I have made several attempts to obtain information as regards the suggested test.

My original challenge was that a test should be conducted at Faraday House, on Faraday House instruments. I now learn by the certificate that the tests were not conducted at Faraday House, nor upon Faraday House instruments, but were carried out at Messrs. Napier's works on Napier instruments.

Desirous of getting to the bottom of this test, I wrote to the authorities of Faraday House, asking a number of questions, and the reply that I have received is as follows:—

"In reply to your letter of yesterday's date we believe that Messrs. Edge are fully acquainted with the conditions under which the test was carried out, and must refer you to them for the particulars you require."

No comment is required from me beyond suggesting that, if there were one, a straightforward and satisfactory reply to my letter should have been easily forthcoming.

Faithfully yours,
D. M. WEIGEL.

June 15th, 1906.

CO-OPERATION INVITED.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—The conduct of the St. Neot's Bench and the local police towards motorists has been so oppressive that some of your readers may be interested to know that I am instituting proceedings against certain of the police there for detaining me because, after conviction, I failed to produce my licence immediately. I shall be much obliged if anyone who has suffered similar treatment will communicate with me, or my solicitors, Messrs. Kenneth Brown and Company, 11, Pancras Lane, London, E.C.

Your kind insertion of this letter in your valuable paper will be greatly esteemed by,

Yours faithfully,
ARCHIBALD CANTY.

30, Burton Road,
Brondesbury, N.W.
June 8th, 1906.

THE CLUB AND ADVERTISING.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am going out of my usual course by writing to the Club *Journal*, as I wish very strongly to protest against the way in which the club notice-board is used for free advertisements for different cars.

Lately I have seen on it numbers of telegrams, about numerous doings of certain makes of cars, and I do not think that the club-board should be used for purposes of this kind.

Also, it seems to me that it is a great pity that the Club *Journal* is filled with articles such as the one headed "Accident to Earl Russell's Napier"—it is merely a long account of an accident to a car being driven by a paid chauffeur, and an advertisement for the firm repairing it; the case would, of course, have been quite different if Earl Russell had himself been concerned in it.

Yours faithfully,
F. R. S. BIRCHAM.

Boxmoor, June 23rd.

THE CONDUCT OF SPORTING COMPETITIONS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As rather an old participator in sporting events of all sorts, on Saturday last I attended the South Harting Hill-Climb in the position of a spectator and student of the event, and it seems abundantly clear to me that if events of this sort are to continue to be successful, that exceedingly stringent regulations will have to be made or the present regulations administered in a particularly hard manner.

These competitions seem to be very different from what they were a few years ago, when all the competitors knew one another fairly well, and where such big trade interests were not involved to the extent that seems to be the case now. This particular class of function seems to be more of a trade fight than a pleasant day's sport with so many of the cars driven by paid drivers instead of, as in the past, by the private owner or the principal of the motor firm himself.

We had in this event the nucleus, so it seemed to me, of a very good day's sport, a great deal of time and energy spent on it by the honorary officials of the Automobile and Sussex Clubs, a fair gathering of local spectators, a rather poor gathering of automobilists. An event of this sort should, in my opinion, be one of educational gain, if not of great spectacular effect.

In one particular way interest was knocked out of the competition, and that was by running the fast cars first. It seems to me in such an event the smallest and slowest cars should commence the proceedings, and the most powerful, and therefore the most speedy, class come at the finish, so that the public's interest can be kept up right to the end.

The points where it seems to me the rules want to be drawn very hardly are in regard to competitors who have attempted to take advantage of the rules. On the question of carriage bodies, it seemed to me there were a good many competitors who interpreted the rule exceedingly loosely when they brought themselves under the rule dealing with cars of touring type, fitted with a proper body, and I think an autocratic official would have been very valuable at the weighing in of those cars which presented themselves for weighing in with bodies 1 ft. or more shorter than the chassis, and were placed upon the chassis in a very make-shift sort of way. I think anyone reading the rules strictly would have ruled them out there and then, and would not have allowed them either to weigh or present themselves in the competitions enclosure, as it is simply asking for competitors in the next competition to try and go one better and gain a further advantage for themselves. I say distinctly that it was a disgrace that several of the cars were allowed to start under this rule; it was an absolute injustice to those competitors who came there with proper touring bodies fitted up in a proper touring manner.

I think, also, an official at the weighing-in, to give advice on how not to drive up to the weighbridge, would be useful to some of those in charge of the cars. I actually saw one man, who had probably 60 or 70 yards to drive, race his engine, get on to the first speed, then as quickly as possible get on to his second, and dash up to the weighbridge, then jam on all the brakes and almost slide on to it, and this man, mind you, had only to traverse something under a hundred yards. He evidently thought he was in an accelerating and brake-testing competition. Those standing round that I spoke to were not at all impressed with his skill as a driver, but were impressed with the fact that he must be in league with a tyre company to see how quickly he could destroy his employer's tyres.

When seated at the starting-line, I also saw a few curiosities which appeared to me to be very inadvisable to allow to start at all; they should have been ruled out and sent home to study the rules more carefully, as it was clearly set out that the cars had to be fitted with proper silencers, and that "cut-outs" were not allowed. Two cars that I saw go up the hill apparently started from the starting-line, and directly they got going, evidently opened their cut-outs or the equivalent. I could not find that either of them were spoken to by any official.

On the starting-line itself I noticed that in some cases drivers had allowed their exhaust pipes to leak very badly or become disengaged from their silencer, no doubt by mistake; but still I think a stiff official here would have simply sent these gentlemen home to learn to come to the starting-line in a more complete manner, as they obviously had an advantage over their fellow-competitors who adhered strictly to the rule and kept their exhaust pipes properly attached to their silencers. Another competitor, I noticed, did not have a cut-out, but had bored small holes along a considerable length of his main exhaust pipe. This appeared to me ingenious, and he apparently was rewarded for his ingenuity by being allowed to start and run in the competition, although the holes were observed by an official. It appeared to me that, if this is allowed, there surely can be no particular limit to the number of holes that may be drilled in an exhaust pipe; therefore, those who want to get rid of any back pressure that might be caused in the exhaust pipe can conveniently do so by drilling some hundreds of small holes in their exhaust pipe. It may be, of course, that this competitor will eventually be prevented from competing, but I think myself it is a hardship on those who run their cars correctly that he should be allowed to start at all.

Another point that seemed to me very objectionable was that competitors starting for a hill climb should be allowed to vomit forth vast clouds of lubricating oil smoke. I think a rule should be made that would absolutely compel competitors to bring their cars to the starting line in a normal running condition, and if they cannot run their cars without this cloud of smoke, then I should suggest that they run in other competitions than those promoted by the Automobile Club, as such competitors cannot be doing good to the cause of automobilism.

Whilst seated at the starting line I was able to see underneath a great many of the cars, and it was my impression that a modern touring car now always includes a proper shield to the underneath portion of the mechanism; but I noticed several cars in which this necessary fitment to a touring car was conspicuous by its absence.

Another point that struck me was the questionable one of having the steering connecting-bar behind the front-axle. I noticed several cars which had this, but apparently had quite overlooked the reason for it as they carried this bar very much lower than the front-axle, so that although they had all the disadvantages of the connecting-rod being behind the front-axle they had not the advantage of having it protected by the front axle. Others had evidently carefully noticed this, and had brought up the connecting-bar so as to be sheltered by the front-axle, but had omitted to notice that whilst they gave clearance of five inches between the front-axle and the frame they had allowed two inches between the steering-bar and the bottom of the engine. This would be a very nice sort of touring car on rough roads, and I should think would result in one reading about another motoring accident in the daily Press.

One could go on giving instances of this sort of very large numbers, but I think those raised are enough points to warrant some ventilation in your columns.

Yours truly,

June 25th. S. F. EDGE.

* * * *

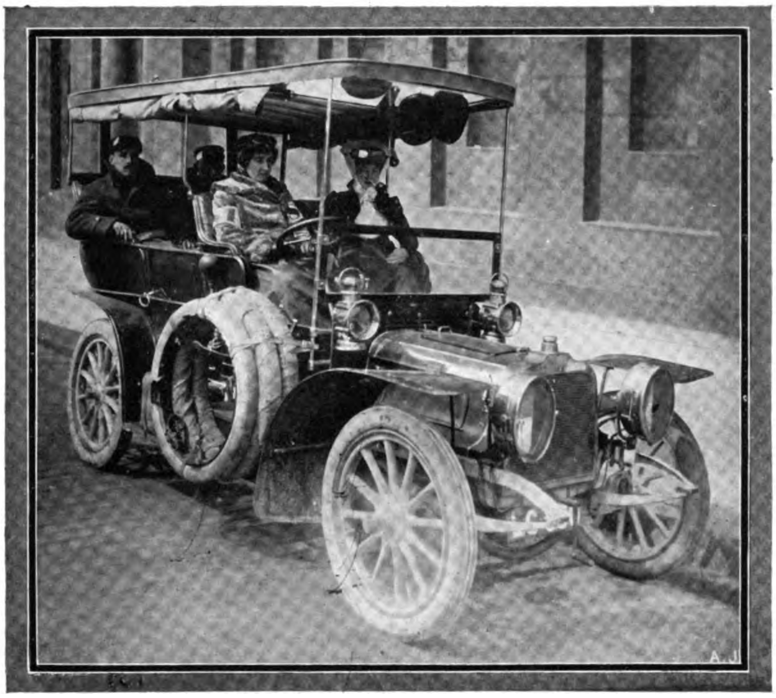
Aldershot Military Fete.

THIS great event, which is for the benefit of various military charitable institutions, will be held on the grounds of Government House on July 10th and 11th, and will present, in addition to a military concert by massed bands, a naval and military pageant and a torch-light tattoo, ascents in captive balloons, for which the passengers will be charged *2s.* each, and in free balloons, for which they will have to pay £5.

The Daimler Outing.

ON Saturday last the employees of the Daimler Company to the number of 850 had their annual holiday outing at Blackpool, to which popular resort they were conveyed by two trains, the first of which left Coventry at the agreeably early hour of a quarter to four in the morning, so that Blackpool was reached by half-past eight. After a substantial breakfast, the visitors thoroughly sampled the delights of Blackpool, and started on their homeward way to Coventry at 11.30 p.m., arriving at the city of the three tall spires at 5.20 on the Sunday morning. The office staff contemporaneously had an outing to Dunchurch by brake and motor car, the number of those taking part in this excursion being 120. At Dunchurch various amusements were provided, consisting of athletic sports, luncheon, dinner and concert before the return drive to Coventry.

At Stockport a good test for the climbing powers of cars exists in Hatton Street, and our picture shows a 14-h.p. Germain Car belonging to Mr. J. Greenhalgh, of Heaton Chapel, which was recently tested on this rise by Mr. J. G. Looker, the proprietor of the local motor works at Heaton Moor, prior to handing her over to her owner. After taking her up with 4 on board, and 6, a third run was made with 8 up, when she was stopped in the middle to take the above photograph.


A. J.

Miss Agnes Wood at the wheel of the 12-16-h.p. Clement-Talbot Car, which she so successfully drove in the London to Edinburgh run of the Motor Cycling Club on the first two days of this month. Particulars of this event were given on June 9 in "The Automotor Journal." Miss Wood, who arrived in Edinburgh to schedule time, made a "non-stop" run between the English and Scottish capitals of 22 hrs. 40 mins., including 1½ hours' compulsory stoppages on the road.

The Appeal from High Barnet.

THE appeal of Mr. Mortimer, who is being supported by the Motor Union, and was released as we chronicled last week from Pentonville Prison, to which he had been committed in what is alleged to be an illegal manner by the High Barnet Justices, is to come on for hearing on July 10th.

Another Appeal.

MR. WILLIAM FLETCHER, who was sentenced by the Hayward's Heath Bench, as recorded by us last week, to a month's imprisonment without the option of a fine, has applied to the Justices to suspend the sentence pending an appeal to the East Sussex Quarter Sessions. The application was granted, Mr. Fletcher being bound over in two sureties of £100 each to prosecute the appeal at the Quarter Sessions.

A Royal Appointment.

A ROYAL WARRANT has been granted to Messrs. S. Smith and Son, of the Strand, appointing them Speedometer and Motor Watchmakers to His Majesty King Edward. Messrs. Smith and Son are justly gratified at this mark of Royal recognition in respect to their specialities, as, if such a thing were needed, it sets the seal on the reputation of their instruments. His Majesty's good example to motorists by the use of speedometers might be more generally adopted as a sure method of checking the imagination as to speed, leaving out of the question the *prima facie* evidence which such an instrument carries, in police charges of driving at excessive speed.

Our Visitors—the German Editors.

EDITORS of newspapers are essentially up-to-date in all things, so that it was but to be expected that the fifty German representatives of the Press, who are at present visiting London, should disdain all other means of conveyance, and be doing the tour of the Metropolis in automobiles.

"Austin" Cars and America.

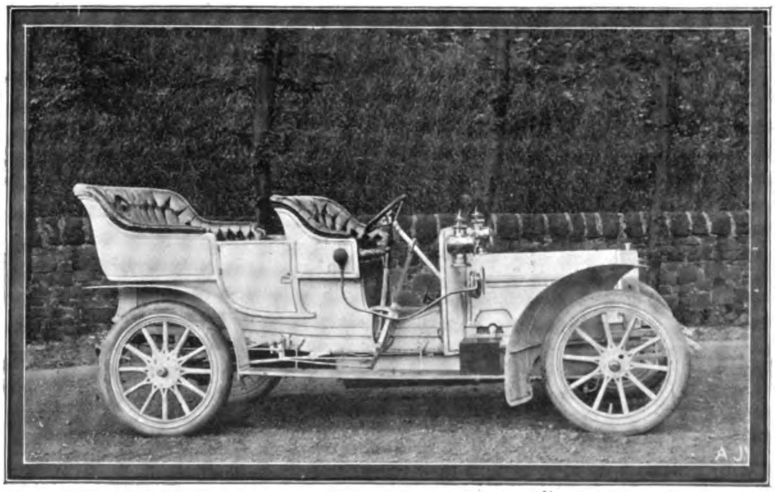
THE Austin Motor Company, Limited, of Northfield, Birmingham, write us in respect to an advertisement which they have noticed, in one of the American trade journals, of the Austin Automobile Company, Grand Rapids, Michigan, U.S.A., and they point out that this company has no connection with the Birmingham Austin Company, nor do they represent the Birmingham firm's interest in America in any way.

Testing the Darracq-Serpollet 'Bus.

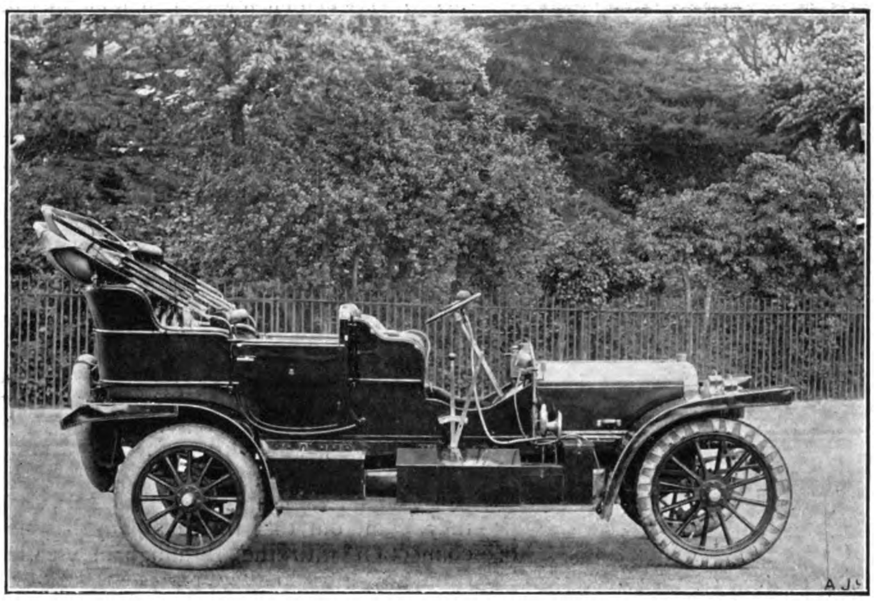
A TRIAL trip round France, covering about 2,500 miles in 15 days, has just been completed for testing purposes by one of the new Darracq-Serpollet steam motor 'buses, which are destined, within a reasonable time, to be put in service on the London streets. The whole run was made without accident of any kind, and, during the test, a "non-stop" run of 274 miles was accomplished in 19 hours.

"The Road" No Longer Runs.

A LOST cause has always something pathetic about it, and most people will feel sorry for Mr. W. P. Betitany, whose bankruptcy is recorded, and ascribed mainly to the failure of the paper entitled *The Road*, of which he was proprietor. Our contemporary was devoted solely to coaching and driving, and its failure is to a large extent attributed to the diminished interest in this form of locomotion due to the popularity of the automobile.


A. J.

The 24-30-h.p. New Arrol-Johnston Car which took part in the Scottish Reliability Trials. This was the first occasion upon which a car of this type, which is fitted with a 4-cylinder vertical engine, has competed in any public event.



Viscount Halifax's 24-h.p. Thornycroft Car, which he has now had in constant use for the past nine months.

"Pour Encourager les Autres."

THE Colchester Magistrates recently mulcted six motor car drivers in £30 and costs. By the irony of circumstances the Mayor of Colchester, who was one of the magistrates, had on the previous Saturday, when the guest of the Essex County Automobile Club, expressed the hope that motor cars would often visit Colchester!

Motor Traction in Nigeria.

THE possibility of employing motor traction in Nigeria, it would appear from a question by Mr. Walker to the Under Secretary for the Colonies, has been for some time engaging the attention of the Government. Some experiments have been made, the results of which, however, are not as yet known.

Sir John Hibbert Misunderstood.

IN referring editorially to a recent speech of Sir John Hibbert's, in which he was reported to have expressed himself as in favour of increasing the taxation of motor cars, we very naturally adopted a critical attitude towards his observations. Since then we have heard from an esteemed correspondent, who is also an admirer of Sir John Hibbert, that the general opinion in the north of England is that Sir John Hibbert, when referring to motor cars, did not mean motor cars as usually understood, but motor wagons, which do not contribute to the revenue of the country in the way that pleasure cars do. Sir John, it will be remembered, has on previous occasions referred to the damage done to the road by motors, and we are given to understand that in that case also he is to be interpreted as referring, not to pleasure vehicles or light delivery vans, but to heavy motor vehicles. We are delighted to find that Sir John Hibbert is generally regarded up north as being friendly to automobilism, and that no one thinks of misunderstanding him when he is reported as using expressions like these.

The Fashionable Motor Car Wedding.

"GOING away" in a motor car seems to have become the orthodox method of starting a honeymoon, but the operation was performed with special aplomb at the recent marriage of Lord Ninian Crichton-Stuart and the Hon. Ismay Preston, at Gormanston.

Birmingham Fireworks.

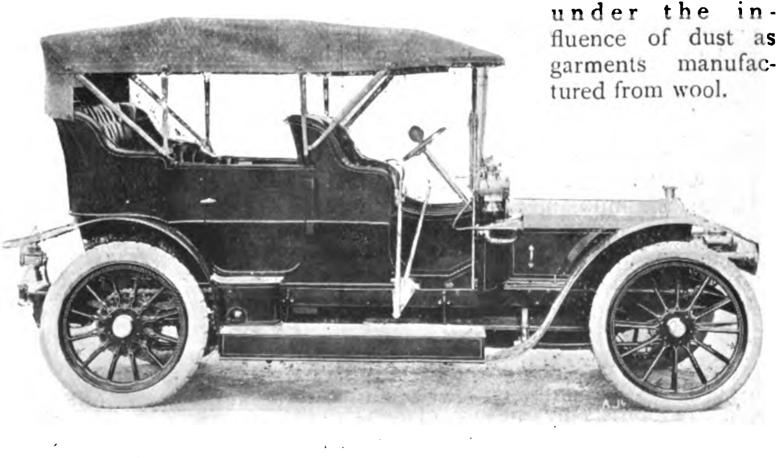
THE motor car is to take a prominent part in the "triumph" which Mr. Chamberlain is to celebrate at Birmingham on the 7th of next month. A big procession of motor cars is to escort him round the principal parts of the city, and, when it gets dark, fireworks are to be sent off from a balloon stationed 2,000 ft. above the city. We hope the balloon will feel comfortable!

The Motor Car and the Top Hat.

THIS year's Ascot was characterised by the largest assemblage of motor cars that ever proceeded to the course. We have often had occasion to remark approvingly of how the automobile has ousted the top hat—that hideous and (for hot weather) unbearable form of head-gear—but even the motor car is not quite able to eliminate it from Ascot, where it is a sacred institution. The difficulty was overcome by those who travelled to the course in automobiles by taking their top hats in cases with them, and numerous chauffeurs were seen in the neighbourhood of the course polishing up these relics of a former age with as much alacrity as they would bestow upon the brasswork of the cars.

Nothing like Mohair.

THE Bradford Chamber of Commerce is very much interested in the development of mohair for motoring fabrics, particularly for ladies, as it has been discovered that mohair garments, which can be made quite comfortable and attractive-looking, do not become as dirty and unpleasant under the influence of dust as garments manufactured from wool.



The first "finished" Austin Car which has been built to the order of Mr. Harvey Du Cros, Junr. It is a side entrance double phaeton standard model.

A Useful Club Year-Book.

We have received from the North-Eastern Automobile Association a handy little volume which is as useful as anything could be to motorists of the Newcastle and Tynemouth district and the counties of Durham and Northumberland. It is provided with six good outline maps of the Darlington, Stockton, West Hartlepool, Durham, Sunderland, and Newcastle districts, and is especially provided with tables for enabling the particulars of members' cars to be entered and continuous record of their doings kept, whilst other information, such as car index numbers, &c., are included in the little volume. The membership of the Association is steadily increasing, which is hardly to be wondered at considering the advantages attaching thereto. As it is affiliated with the Motor Union, all members become *ipso facto* members of that body with the accompanying privileges. In addition, the Association has made special term swith a number of hotels and garages, and these are indicated on the maps above referred to.

A Motoring Map of England.

The "Perrier" Table Water proprietors have got out as an advertisement a very admirable detailed map of England on a large scale, suspended on rollers in the manner of the maps with which most of us are familiar, or should have been, in our youth. The scale is a large one, and the main roads are indicated by double lines, whilst the single line is employed to show roads of less excellent quality. What the Isle of Man has done to the Perrier Company we are rather at a loss to understand, as in their map its place is taken by a plaque setting forth the merits of Perrier Table Water. Considering how the Isle of Man assisted the Gordon-Bennett Trials and the Tourist Trophy Race, this peculiarity of the Perrier map is the more to be wondered at.

PUBLICATIONS RECEIVED.

The Automobile Handbook, 1906. London: The Automobile Club, 119, Piccadilly, W. Price, 3*s.* net.

The Encyclopædia of Motoring. Edited by R. J. Mecredy. Dublin: Mecredy, Percy and Company, Limited, 34, Lower Abbey Street. Price, 7*s.* 6*d.* net.

Leamington Spa, *Clifton*, *Lowestoft*, *Llandrindod Wells*, *Weymouth* (five volumes of the official publications of the Urban District Councils). London: The Health Resorts Development Association, 2, Gray's Inn Road, W.C.

The Law of Heavy and Light Mechanical Traction on Highways in the United Kingdom. By C. A. Montague Barlow, LL.D., M.A., and W. J. Hicks. London: Sir Isaac Pitman and Sons, Limited. Price, 8*s.* 6*d.* net.

Petrol Peter. By A. Williams. London: Methuen and Company. Price, 3*s.* 6*d.* net.

"*The Car*" *Road Book and Guide.* Edited by Lord Montagu. London: *The Car Illustrated*, Limited. Price, 12*s.* 6*d.* By post, 13*s.*

Itinerario-Profilo del Pian della Fugazza and *Passo del Pordoi* (2 volumes). Milan: Touring Club Italiano, Via Monte Napoleone, 14.

Targa Florio, 1906*: Circuito Siciliano, e "Perla del Mediterraneo."* Roma: Societa Editrice di "Novissima" Sez. Lavori di Stampe.

A Motor Car Divorce. By Louise Closser Hale. London: Duckworth and Co. Price 6*s.*

Catalogues.

Motor Lorries: Motor Vans. The Albion Motor Car Company, Limited, South Street, Scotstoun, Glasgow.

Thornycroft Motor Launches. John I. Thornycroft and Co., Limited, Chiswick.

Modern Metal Working Machine Tools for Motor Car Manufacturers. C. W. Burton, Griffiths and Co., Ludgate Square, E.C.,

The Car: Running Costs. London: The Bettoruss Non-Skid Tyres (1906), Limited., Craven House, Kingsway. Price 6*d.*

COMMERCIAL POINTS.

Wheel Repairs.—It is part and parcel of motoring to know the whereabouts of first class repair works, and it is, therefore, important for motorists to bear in mind the facilities afforded at the new Pimlico works of Messrs. Smith, Parfrey and Company. These well known wheelwrights are one of the oldest established firms in the country, but since they have moved to Hammersmith from their old works—which were demolished in the construction of the new Victoria railway station—they have far greater facilities for dealing with the work of repairing motor cars. In addition to their enormous wheel trade, they have a high reputation for the manufacture of axles and springs, and are, therefore, able to give immediate and expert attention to the repair of damage to such parts. Bent woodwork, such as is used for mud guards, panels, &c., is also very much their speciality, and an electric welding plant is an importan addition to the apparatus ordinarily available in most repair shops.

Arrol-Johnston Motor Boats.—Although the New Arrol-Johnston Car Company are mainly known to the automobile world by their motor cars, they are also very successful builders of motor launches. Recently two 12–15-h.p. New Arrol-Johnston motor boats, built to the order of the Fylde Motor Service Company, were successfully launched, and are easily capable of running, under ordinary conditions, at a rate of eight knots per hour.

The officials of the Land's End to John-o'-Groat's Autocycle Club's trial used an 8-h.p. Wolseley car placed at their at their disposal by the Wolseley Company. This company received the following telegram from Wick, signed by the secretary of the Autocycle Club:—"8-h.p. Wolseley successfully completed Land's End-John-o'-Groat's trial, climbing all hills three passengers up. Congratulations." Although not an official trial, this performance of a small powered car over this arduous course is noteworthy.

Castle Coils and Castle Accumulators are as popular as ever, and were used in the Scottish Trials by Mr. Sangster, who drove a 40-h.p. Ariel Simplex, and they were also fitted on the Rover cars. In the Land's End to John-o'-Groats' run, they were used by Miss Muriel Hind, on her Singer tricar, while Castle accumulators were also fitted to the Riley tricar.

20,000 Mile Tour.—Mr. Fritz Loser, chairman of the Belsize London Agency, has just started on a 20,000 mile tour around the Continent. He is driving a 40-h.p. Belsize Car, and intends to open up business in various centres. Among the more important places visited will be Luxemburg, Strassburg, Heidelburg, Mainz, Frankfort, Berlin, Nuremberg, Innsbruck, Vienna and Paris.

Adams-Hewitt Irish Agents.—The Adams Manufacturing Co., Limited, have appointed the Dublin Autocar Company, of Dublin, Ireland, their sole agents for the central counties of Ireland, including Meath, Louth, West Meath, Longford, Roscommon, Galway, King's Co., Queen's Co., Wicklow, Dublin, Kildare. This firm will handle the sales of the Adams-Hewitt car as their speciality. Intending purchasers of light cars in the central counties of Ireland can obtain full information from the above firm, who will shortly be in a position to give demonstrations on the standard type "R" car, together with trial runs.

Maxwell Cars.—Both the 8-h.p. types, which have epicyclic change-speed gear, and the 16-h.p. models, which have a gear-mechanism of the sliding spur-wheel pattern, are very fully dealt with in a new catalogue that has just been brought out by the F. W. Peckham Motor Syndicate. Contained in it also is a specification of a new 32–40-h.p. Maxwell that has a 4-cylinder vertical engine—instead of the twin, horizontal, opposed cylinders employed on the smaller vehicles—and this carefully prepared booklet also gives all details concerning the deferred payment system which has been introduced by the Syndicate. These low-priced cars of American manufacture are so rapidly becoming known and appreciated in this country that many of our readers will doubtless avail themselves of the opportunity that presents itself of obtaining further particulars concerning them. In the Scottish Reliability Trials, in particular, both the 8-h.p. and the 16-h.p. car gave an excellent account of themselves.

The Standard Motor Agency, Limited, advise us that they have opened a depôt at 106, Albany Street, Regent's Park, N.W., where for the future the address of the company will be.

Mr. A. Mosses, of the Clement Motor Company, Ltd., 3, Leicester Street, Leicester Square, London, W.C., has supplied to the Right Hon. Charles Booth two 24–32-h.p. Clement cars, while his son, the Hon. George Booth, has acquired an 18–28-h.p Clement model.

A 16–20-h.p. Beeston-Humber landaulette has just been secured by Lord Ampthill.

The Marquis of Bath has recently honoured the Daimler Company by the purchase of a 28-h.p. Daimler car.

As a result of the British Motor Boat Club having made their headquarters at Nuthall's Restaurant, Kingston-on-Thames, the management have arranged for a series of illuminated promenade concerts in the Riverside Gardens on Thursday evenings, for which popular London artistes have been engaged. No doubt this will be an extra inducement for motorists to run down from town and enjoy a summer evening by the river, the route lying over Putney Vale and through Richmond Park. It may be noted that a *table d'hote* is served in the restaurant from 6.30 to 8.30.

MACHINE MOULDING.—We have received from Messrs. Bonvillain and Ronceray, of Paris, their latest catalogue of moulding machines. It is a compilation which cannot fail to be of great interest to those whose business lies in the production of first-class castings. This firm have given very great attention to the art of moulding by machinery—which has hardly developed to the extent which could be wished—and claim to have produced a "universal" machine, which can satisfactorily undertake the moulding of any pattern, no matter how intricate it may be.

STANDARDISATION OF FITTINGS FOR HEADLIGHTS. — In addition to the standardisation of sizes of flat tongue for side and rear lamps the Committee of the Accessory Section of the Society of Motor Manufacturers and Traders have had under consideration the question of bringing about standardisation of fork brackets for headlights. It being found that 6 in., 7¼ in., and 8¼ in. centres respectively represent the sizes in general use, they recommend that, in view of the great benefit to be derived from standardisation of such details, these three sizes be accepted as standards, and all lamp makers are requested to build to these sizes and all car manufacturers to make fork brackets accordingly. The diameter of the fork ends at base of taper should be 13/32 in. for the 6 in. size, and ½ in. for the other two sizes respectively.

NEW COMPANIES REGISTERED.

Beeston Accumulator Syndicate, Ltd., Post Office Square, Beeston, Notts.—Capital, £500 in £1 shares (300 10 per cent. preference).

Motor Ricksha Co., Ltd., 119, Victoria Street, S.W.—Capital, £50,000 in £1 shares. First directors, C. Roberts, J. E. Hunter, J. W. Palmer, and E. Jennings.

Pradeau Wheel Syndicate, Ltd.—Capital, £5,000 in 2,375 "A" and 2,625 "B" shares of £1 each.

Radford Brothers, Ltd.—Capital, £5,000 in £1 shares. Objects, to carry on business of motor car proprietors. First directors, R. H. Radford, C. A. F. Radford. and F. V. Radford.

Trier and Martin, Ltd., 101, New Church Road, Camberwell, S.E.—Capital, £5,000 in £1 shares. Objects, to carry on the business of manufacturers of machinery, engines, motors, &c.

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BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

The first date given is the date of application; the second at the end, the date of the advertisement of the acceptance of the complete specification.

125. 2nd January, 1906. Improvements in Friction Clutches. F. L. Croft, T. A. Perkins, and F. Croft, all of Great Northern Works, Thornbury, Bradford, in the county of York; and H. Lindsay, of 7, Woodhall Road, Thornbury, Bradford. This invention relates to certain improvements in what are generally known as band clutches. Fig. 1 is an elevation of one side of the clutch. Fig. 3 is a side view of the other side of the clutch. The collar, 2, sliding on the driven shaft, 3, actuates the toggles, 5, which act upon the levers, 6, imparting a turning motion to the spindles, 7, which carry the short levers, 8. Various devices, such as a ball and socket joint, can be employed to form the swivel, or knuckle connection, between the toggles, 5, and the levers, 6. In the clutch shown each lever, 6, is made with a long bearing pole for the shank of the pin, 10. Each toggle, 5, has a pivoted jaw to receive the eyelet, and of the pin, 10, the shank of which passes through a bearing hole in the lever, 6, and is held in place by a collar. This device is simple and effective and may be assembled either for a right-hand or left-hand drive without alteration to component parts. Each lever, 8, is connected to the tail end, 20, of one of the bands, 12, to be drawn tightly upon the drum, 13, thus the movement of the sliding collar, 2, controls the tightness or slackness of the bands. The head ends, 15, of the bands, 12, are fastened to the driving arms, 16, by the stud bolts, 17. The cylindrical driving drum, 13, is secured to the driving-shaft, 4; the clutch is assembled to suit a direction of rotation indicated by the arrow. As soon as the clutch is put into operation there is a frictional drag upon the tail ends, 20, which assist to wind up the bands tightly upon the drum, and this offers no resistance to going into gear. Should the direction of rotation be reversed to that indicated, or what is equivalent, should the drum, 13, become the driven and not the driving member, the bands would tend to become unwound upon being put into gear, and to avoid this a clutch having the friction bands, mechanism and supports for same exactly reversed would be required. All that is necessary is to exchange positions of stud belts, 17, and spindles, 7, the band and other parts falling in with the reversed arrangement. It is important that the keys, 9, securing the levers, 6 and 8, to the spindles, 7, should be placed as shown at the same angle to the vertical, so that the clutch may be used for a right-hand drive or a left-hand drive without making fresh keyways or other alterations. In order to obtain the greatest arc of contact for the bands, 12, the tail ends, 20, cross the head ends, 21. To effect this each head end, 21, is made with a slotted hole, 22, to allow the central bolt, 24, forming a continuation of the tail end, 20, to pass through. A series of adjustable stops, 31, are placed at intervals around the circumferance of the bands, and fitting lugs or projections, 32, are secured to facings formed in the driving disc, 30. In disengaging the clutch the springs, 25, are made to undo the bands, 12, by forcing the tail ends, 20, partly round the drum, 13. Since the other ends, 22, of the bands are fixed the result of this motion is to expand the bands, 12, and cause them to assume a diameter greater than the drum. The outside of the bands, 12, thus come in contact with the stops, 31, and are pressed firmly against them.—May 24th, 1906.

FIG. 1.

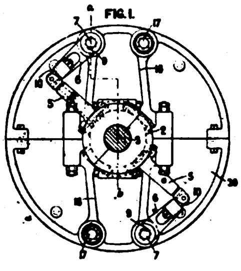
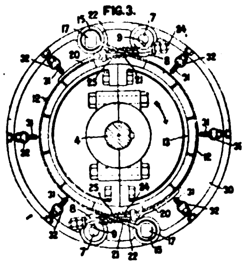
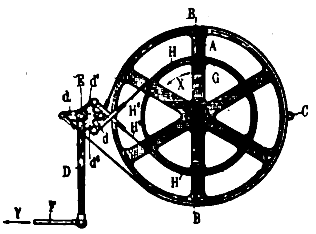


FIG. 3.



701. 10th January, 1906. Improvements relating to Brakes. The Societe Anonyme Automobiles Mors, of 48, Rue du Theatre, Paris. This invention has for its object a compound brake which is applicable to all vehicles and to any rotating shaft. This form of brake is characterised by the combination of a circular brake and a capstan or differential pulley. A circular brake of the usual type is controlled in the ordinary way by operating pedal or lever; it is combined with the capstan or differential pulley, the cable of which is connected to the part which controls the operation of the circular brake. The capstan is simultaneously acted upon, its action becoming automatically cumulative to the force and amplifying it to any desired degree. There is one figure. The drum upon which the braking action is to be exerted is indicated at A. It is surrounded by two flexible half-bands, BB, attached on the one hand to a fixed point. C, and on the other hand to two arms, *dd*, belonging to a lever, D, pivoted at E, and upon which the driver acts by means of an appropriate lever or pedal operating mechanism, the termimal part of which is indicated at F. To the drum, A, there is fixed a differential pulley, G, upon which is wound in one or more convolutions a cable or ribbon, H, the two lengths, H^1, H^2, of which are attached to two arms d^1, d^2, solid with the lever, D. The direction of rotation of the drums. A and G, which were solid one with the other, is indicated with the arrow, X. The operation is as follows:—When it is desired to apply the brake, the operating mechanism, F, is acted upon in such a manner as to displace the lever, D, in the direction, Y. It follows from this movement that the half-bands, BB, displaced by the arms, *dd*, solid with the lever, D, are applied against the drum, B. But at the same time the arm, d^2, has displaced the length, H^2, of the cable, H, of the capstan which by means of the length, H^1, exerts a considerable pull upon the arm, d^1, thereby causing the lever, D, *dd*, d^1, d^2, to pivot around in the same direction as that in which it is displaced for exerting a braking action by the half-bands, BB. In this manner the effort exerted upon the lever, D, may be amplified to the desired extent with a proportion which depends only upon the ratio of the different lever arms.—May 24th, 1906.



Patent Specifications Published.

Applied for in 1905.

Published June 28th, 1906.

12,558. S. Knight. Variable speed gearing.
12,680. E. Lehmann. Cam-shafts.
13,282. Comp. Automobiles and O. Pfaender. Tension regulating mechanism for transmission chains.
13,319. A. Dougill. Friction driving mechanism.
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1,759. H. M. Reichenbach. Devices for storage of liquid fuel, and supplying carburetted air to intl. combn. engines.
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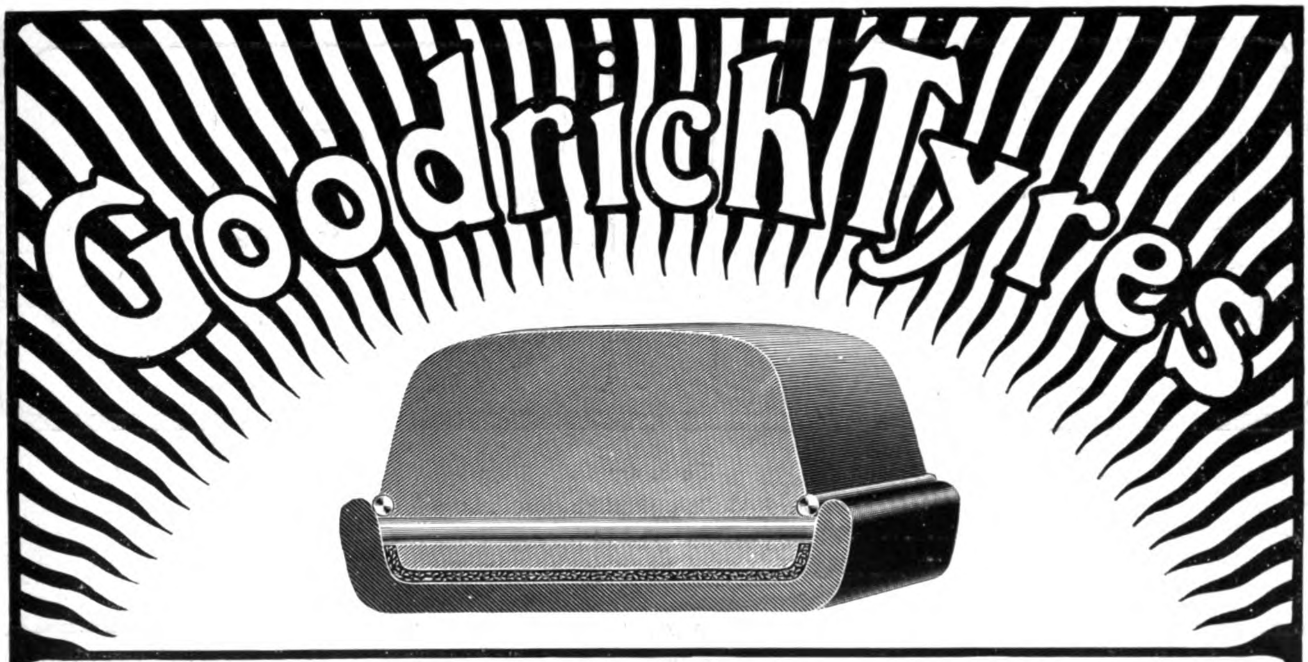

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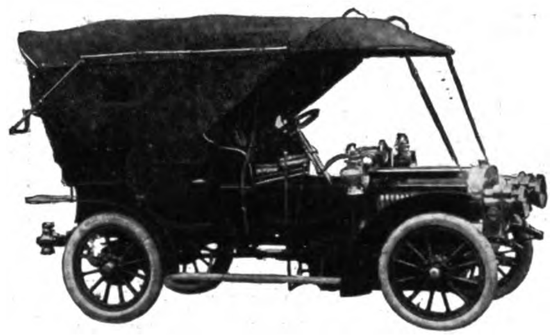

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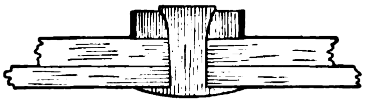

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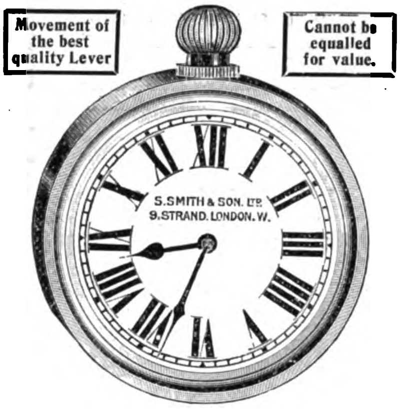

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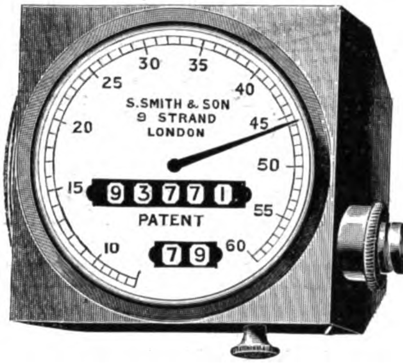

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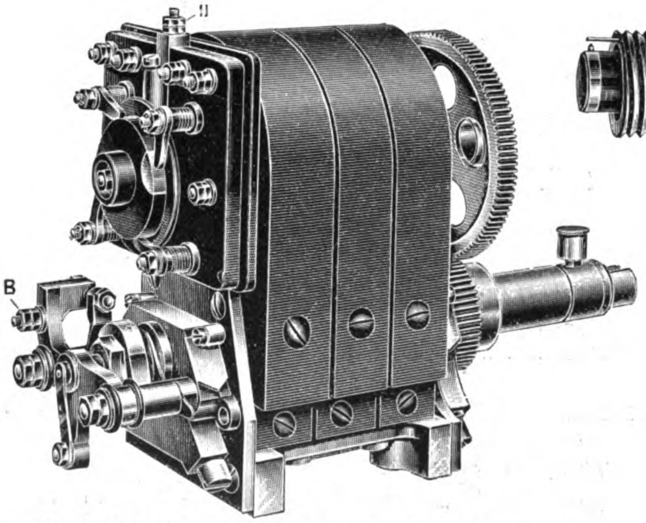

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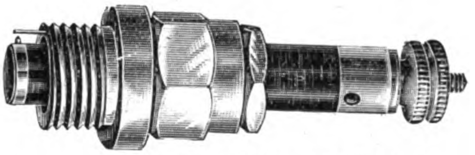

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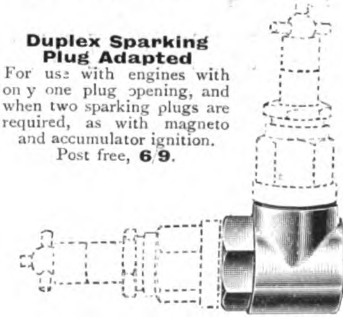

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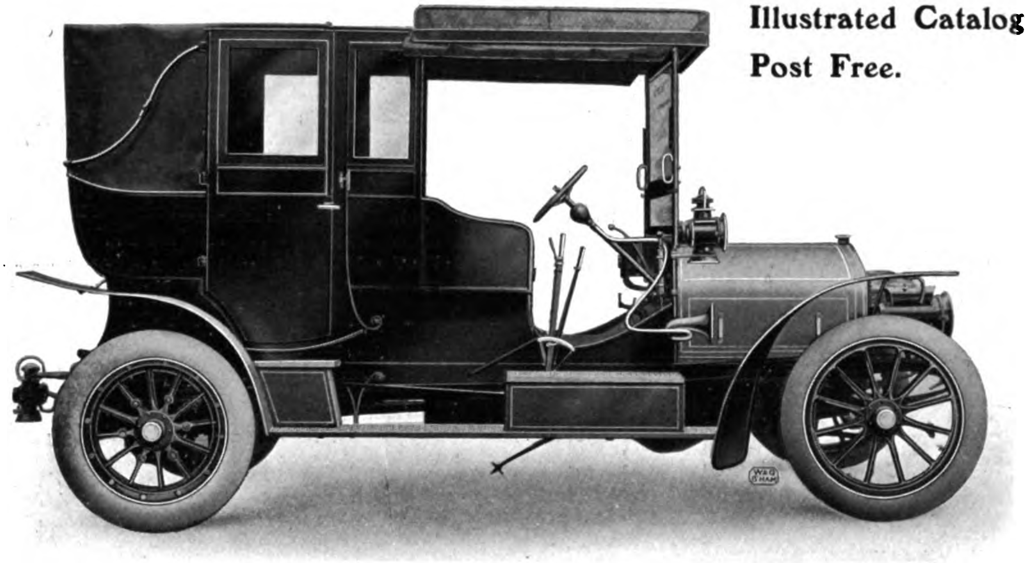

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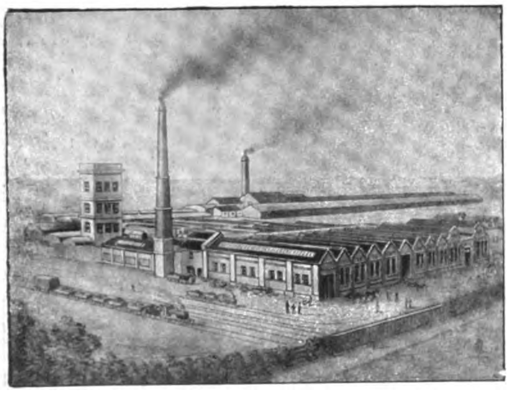

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WINTON MODEL K

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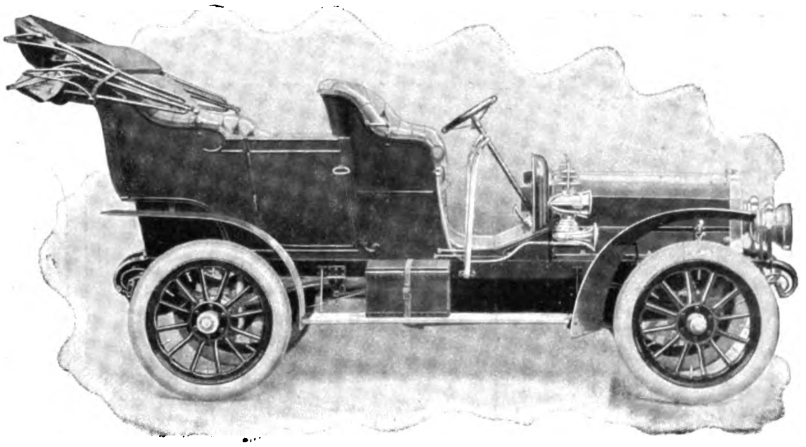

A motor car becomes SECOND-HAND, in value, when the owner has driven it the first time.

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The difference between the price you pay for a *new* car and the price you get for the *same car second-hand* represents DEPRECIATION.

Think about THAT when buying.

It is important to buy a car that will have a high value when second-hand.

Because you don't know how soon *you may want to sell it.*

You may want to sell upon buying a later and better car.

Or you may want to sell for any one of a dozen reasons that will come to mind when you think about it.

Good business judgment, therefore, tells you to buy a car that will Depreciate but little.

Some cars Depreciate *fast.* Notably-under-powered cars, carelessly-made cars, and cheaply-constructed cars; cars of poor material and poor workmanship.

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Remember this, too—Other things being equal, you can always get more money—a greater percentage of purchase price—for a car of *good reputation* than for one of Unknown, Doubtful, or Poor Reputation.

Reputation is the result of *Past Performances.*

Past success in making runabouts does not mean present skill in making touring cars. And *vice versa.* Just remember *that.*

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Observe that the Winton Model K sells at £550 and is not equalled *anywhere* for £700.

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THE SOAR.
CONCLUSION.

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1. When the Motor Car Act of 1903 comes before Parliament for renewal will you vote for the abolition of all artificial speed limits, as such limits are calculated to relieve drivers of their responsibility to drive at all times and under all conditions with caution and consideration?	
2. Will you vote for an Amendment providing that the endorsement of licences shall be confined to serious offences, and be within the discretion of the magistrates?	
3. Will you support a measure requiring the universal lighting of all vehicles after dark, so that they show a white light in the direction in which they are travelling and a red light in the contrary direction?	
4. Will you support a Bill giving effect to the principal recommendations of the Departmental Committee on Highways, and establishing a Central Authority to advise and assist the local road authorities?	

*Candidate's Signature*____________________

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____

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This form, when filled up by the Candidate, should be forwarded by the Motorist to whom it is returned to

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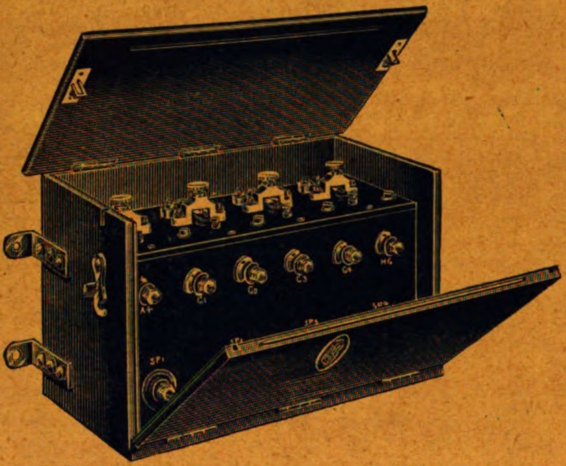

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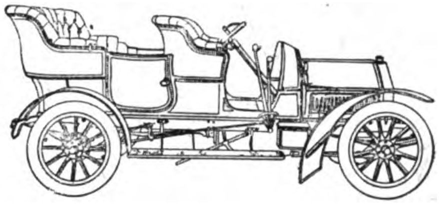

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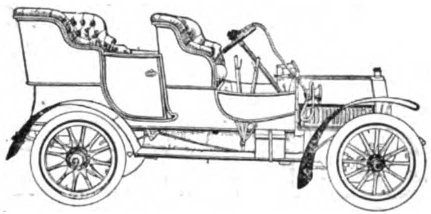

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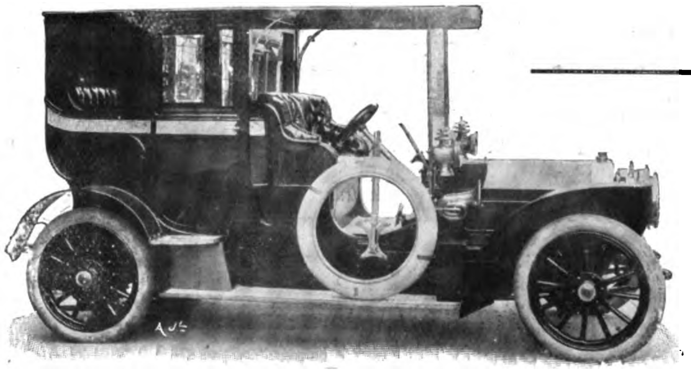

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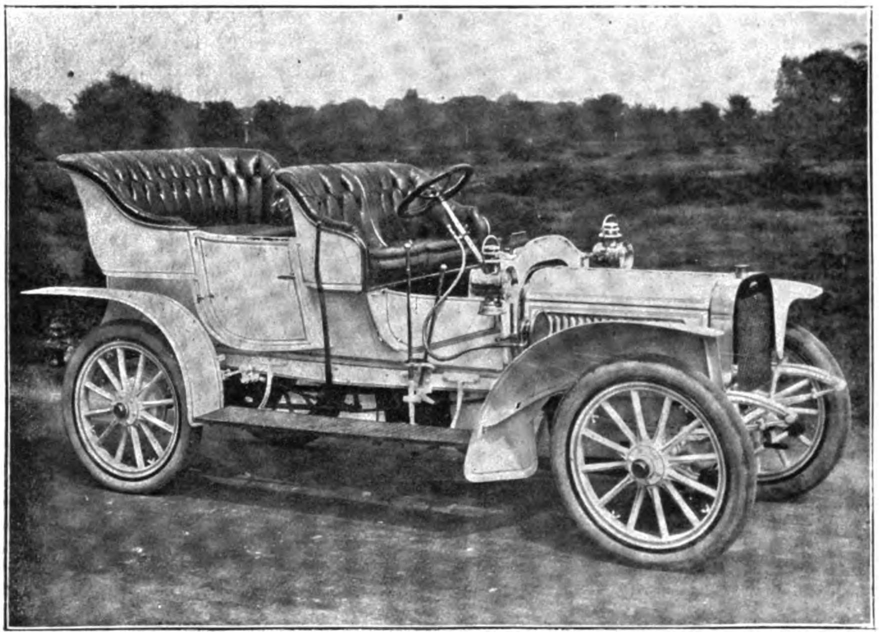

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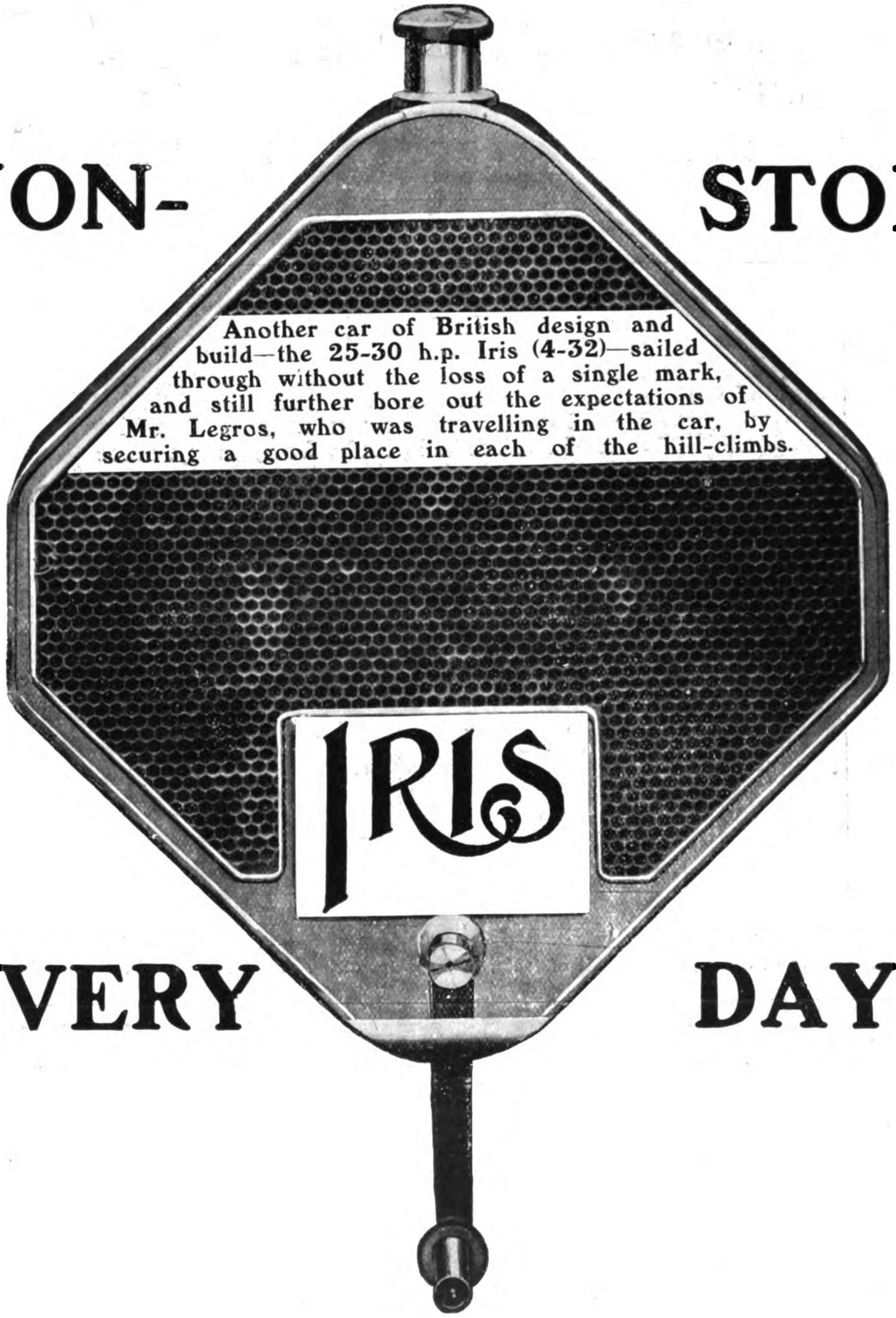

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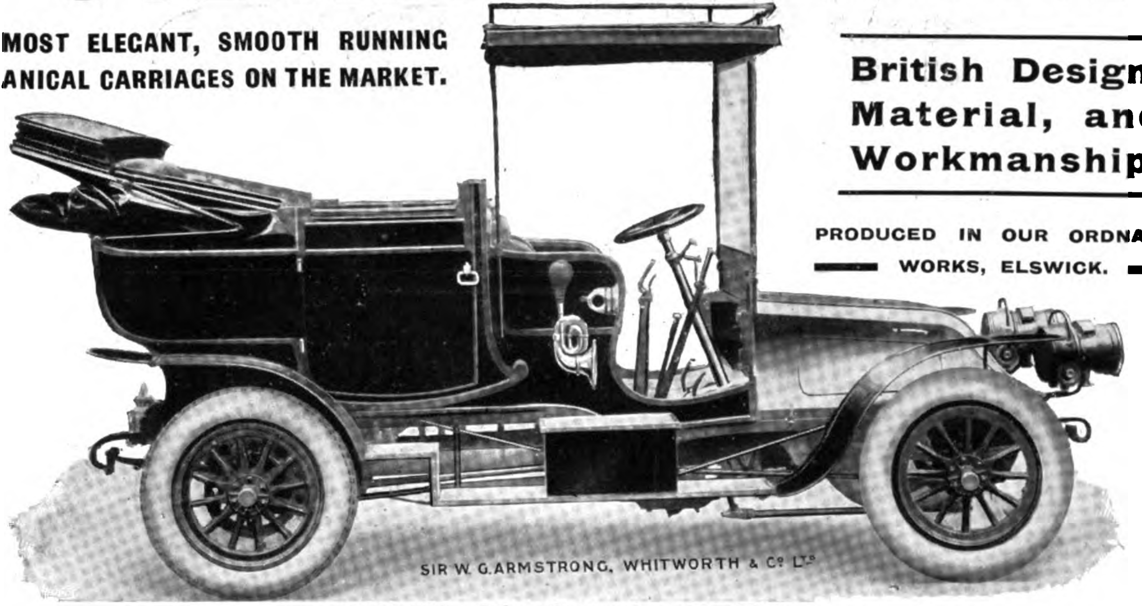

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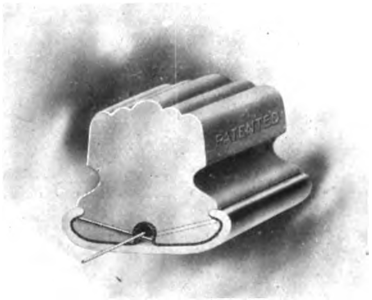

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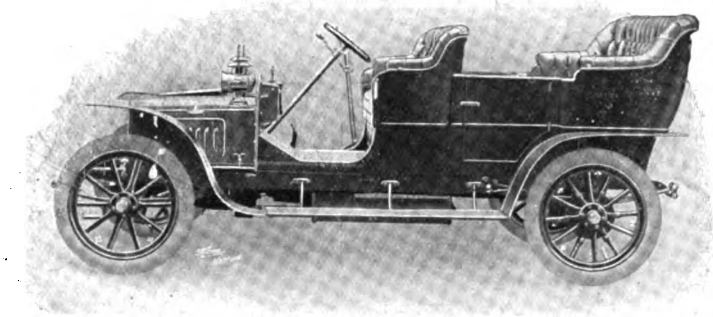

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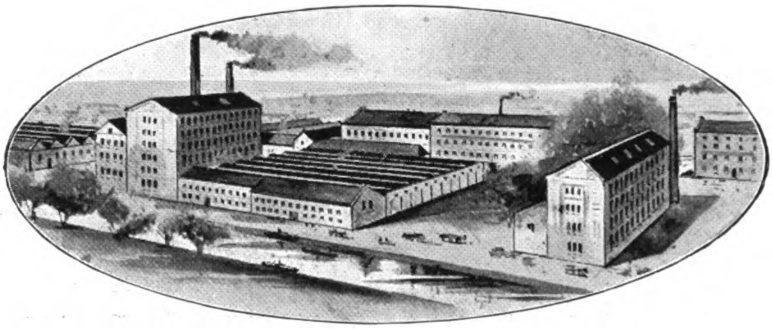

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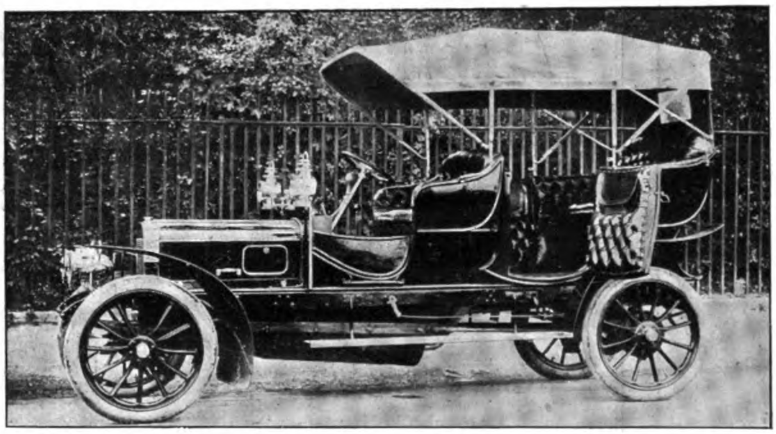

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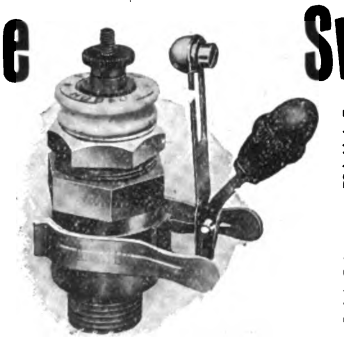

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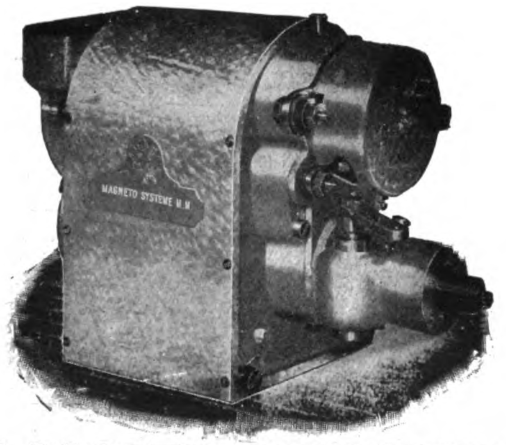

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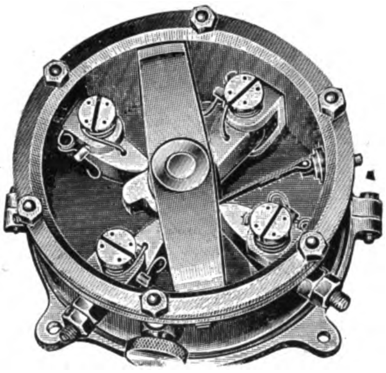

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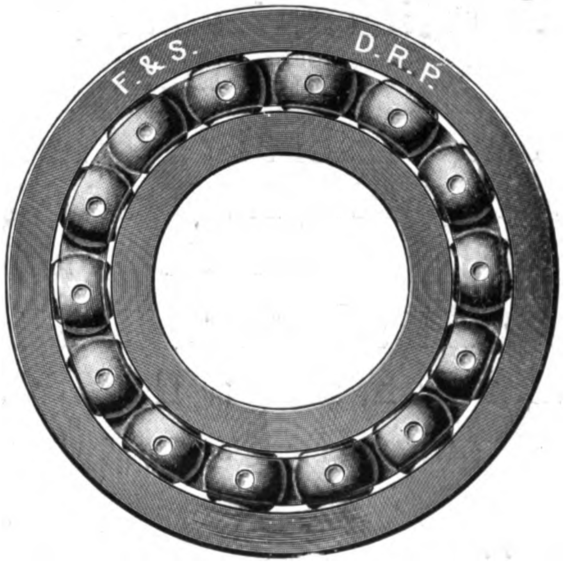

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